

## Appendix G

# Modeling

**Water Year 2010 Interim Flows Project  
Final  
Environmental Assessment/Initial Study**





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## List of Abbreviations and Acronyms

°C	degrees Celsius
°F	degrees Fahrenheit
µS/cm	microSiemen per centimeter
Banks Pumping Plant	Harvey O. Banks Pumping Plant
CACMP	Common Assumptions Common Modeling Package
CBOD	carbonaceous biochemical oxygen demand
CCWD	Contra Costa Water District
CEQA	California Environmental Quality Act
cfs	cubic foot per second
CP	control point
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CVPM	Central Valley Production Model
D-1641	State Water Resources Control Board Water Right Decision 1641
D-1485	State Water Resources Control Board Water Right Decision 1485
Delta	Sacramento-San Joaquin Delta
DICU	Delta Island Consumptive Use
DMC	Delta-Mendota Canal
DSM2	Delta Simulation Model 2
DWR	California Department of Water Resources
EA/IS	Environmental Assessment/Initial Study
EC	electrical conductivity
Friant Division	Friant Division of the Central Valley Project
HEC-RAS	U.S. Army Corps of Engineers Hydrologic Engineering Center – River Analysis System
I/O	input/output
Joint-Point	Joint Point of Diversion operations for the Central Valley Project and State Water Project
Jones Pumping Plant	C.W. “Bill” Jones Pumping Plant
LOD	level of development
MAF	million acre-feet
MND	Mitigated Negative Declaration
MWQI	Municipal Water Quality Investigation

## San Joaquin River Restoration Program

NEPA	National Environmental Policy Act
NO <sub>x</sub>	nitrous oxide
PEIS/R	Program Environmental Impact Statement/Report
PG&E	Pacific Gas and Electric Company
PM <sub>25</sub>	particulate matter of 25 micrometers or less
PM <sub>10</sub>	particulate matter of 10 micrometers or less
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
ROG	reactive organic gas
SJR5Q	San Joaquin River Temperature Model
SJRRP	San Joaquin River Restoration Program
State	State of California
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TCD	temperature control device
TS	time series
USACE	U.S. Army Corps of Engineers
USAN	Upper San Joaquin River Basin Model
USGS	U.S. Geological Survey
USJRBSI	Upper San Joaquin River Basin Storage Investigation
V9B	Version 9B
VAMP	Vernalis Adaptive Management Plan
W2	CE-QUAL-W2
WMA	Water Management Area
WQCP	Water Quality Control Plan
WY	Water Year

# 1.0 Introduction

The San Joaquin River Restoration Program (SJRRP) was established in late 2006 to implement the Stipulation of Settlement in NRDC, et al. v. Kirk Rodgers, et al. (Settlement). As an initial action to guide implementation of the SJRRP, the Settlement requires that the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), modify releases from Friant Dam during water year (WY) 2010 (from October 1, 2009, to September 30, 2010). This first year of releases would allow data to be collected to better evaluate flows, temperatures, fish needs, biological effects, and seepage losses, and water recirculation, recapture, and reuse opportunities. The Proposed Action is to increase the release of water from Friant Dam for 1 year (WY 2010) in accordance with the flow schedule in Exhibit B of the Settlement (Exhibit B) and in a manner consistent with Federal, State and local laws, and any agreements with downstream agencies, entities, and landowners. The Proposed Action also includes the activities necessary to convey the flows in the San Joaquin River system to the Delta, and the monitoring activities to be conducted during the WY 2010 Interim Flow releases. The water released from Friant Dam prior to full Restoration Flows as described in the Settlement is called Interim Flows.

The Year (WY) 2010 Interim Flows Environmental Assessment/Initial Study (EA/IS) describes and evaluates potential environmental consequences resulting from Interim Flows in the San Joaquin River beginning October 1, 2009, to September 30, 2010 (WY 2010 Interim Flows), beginning October 1, 2009, through November 20, 2009, and resuming February 1, 2010, through September 30, 2010, as stipulated in Paragraph 15 of the Settlement. Also described are the potential locations and mechanisms for recapturing WY 2010 Interim Flows within the San Joaquin River from Friant Dam to the confluence of the Merced River (Restoration Area), and in the Sacramento-San Joaquin Delta (Delta). In addition, associated activities that may be undertaken to collect relevant data during WY 2010 are discussed.

Numerical modeling was used to develop much of the quantitative data required for the evaluation of potential environmental consequences. This appendix documents modeling performed to support the evaluation of effects associated with the WY 2010 Interim Flows, and describes the overall modeling process followed, specific models and tools used, major assumptions required to implement the models, and types of outputs generated. Modeling results are presented but no additional analysis or comparisons of alternatives are included.

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## 2.0 Modeling Process

This section documents the overall modeling process, and describes quantitative modeling performed in support of the SJRRP EA/IS and MND.

### 2.1 Need for Quantitative Modeling

Resource areas required for National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance were evaluated in the EA/IS to identify potential effects that would result from implementing the Proposed Action. Resource areas evaluated for potential effects of the Proposed Action include the following:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources – Terrestrial Resources
- Biological Resources – Fish
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

Resource area evaluations for the Proposed Action were based on quantitative and qualitative assessments using output from model simulations, other analysis tools, previous studies, or other existing information. Each resource area was evaluated by applying one or more of the following methods:

- **Comparison of quantitative simulation results** – Some modeling tools used for the WY 2010 Interim Flows EA/IS resource area evaluations provide quantitative output that was used for direct comparisons between the No-Action Alternative and the Proposed Action to identify effects on resources from releasing WY 2010 Interim Flows. For example, output from system water supply operations model (CalSim) simulations was directly compared to identify changes in river flow,

water supply deliveries to Friant Division of the Central Valley Project (Friant Division) long-term contractors, and other effects to Central Valley Project (CVP) and State Water Project (SWP) operations that would result from Interim and Restoration flow releases from Friant Dam.

- **Interpretation/extrapolation from quantitative simulations** – Many of the quantitative models providing output for direct comparisons of effects on resources, as described above, were used to interpret/extrapolate effects on other resources. For example, output from CalSim simulations informs the evaluation of effects to fisheries due to changes in river flows. Similarly, other models were used solely to provide quantitative data for interpretation or extrapolation from quantitative simulations.
- **Interpretation/extrapolation from available data or previous studies** – Existing data and information from previous studies were used to interpret/extrapolate the effects on resources when model simulations were not needed or not feasible. For example, implementation effects on cultural resources were identified in part through a review of previously conducted archaeological and historical studies.
- **Qualitative description with limited or no data** – When available data or previous studies were limited or unavailable, a qualitative description of the effects were developed using professional judgment and any limited data that were available.

A variety of models and other analysis tools were used to identify the effects of implementing the Proposed Action, as described in the following section.

## 2.2 Quantitative Assessment Tools

Models and other analytical tools used in the WY 2010 Interim Flows EA/IS are summarized below. Models that helped identify effects of the No-Action Alternative and Proposed Action, but were not used in the WY 2010 Interim Flows EA/IS, are also described.

### 2.2.1 Models Used in the Environmental Assessment/Initial Study

This section describes models used to evaluate the effects of WY 2010 Interim Flows.

#### ***Water Supply Operations***

System water supply operations effects would result from the Proposed Action for two major reasons:

- WY 2010 Interim Flows have the potential to change flows between the San Joaquin River upstream from Friant Dam to the Sacramento-San Joaquin Delta (Delta). The Delta is a crucial component of the CVP and SWP. Any change to San Joaquin River inflow to the Delta can potentially affect operations of the CVP

and SWP, and thereby affect water supply to the majority of the State of California (State).

- The Settlement includes a goal to minimize water supply effects to local Friant Settling Parties. Water management actions to address this goal may have water supply effects.

CalSim is a water supply operations model that includes CVP, SWP, and Friant Division water supply operations. The model simulates an 82-year period of hydrologic record (1922 to 2003) on a monthly time step. CalSim assumes a constant set of demands, facilities, and operation rules appropriate for each alternative for all 82 years.

CalSim was used to simulate potential water supply operations of the SJRRP Proposed Action. Results of the model were used directly for water supply impact analyses, and indirectly to set overall water operation guidelines for other analyses.

### ***Delta Water Quality***

The Delta Simulation Model 2 (DSM2) was used with CalSim results to describe Delta water quality for the No-Action Alternative and Proposed Action. DSM2 is a hydrodynamic model of the Delta developed by the California Department of Water Resources (DWR) that simulates flow and salinity changes throughout the Delta caused by changes in Delta inflow or CVP/SWP pumping. The model uses monthly CalSim results and produces mean monthly flow and salinity values.

### ***Regional Groundwater***

A custom tool, developed in Excel, was used with simulated flow and delivery data to generate descriptions of regional depth to groundwater and groundwater pumping. This regional groundwater tool is based on relationships describing annual groundwater pumping and resulting groundwater level change developed during litigation studies by Dr. Schmidt (2005 a, b). The tool is not a full groundwater model but used a water balance approach based on CalSim delivery output to produce the regional groundwater description.

### ***Daily Disaggregation***

An adequate evaluation of many of the resource areas required data at a finer time step than the monthly output provided by CalSim. To meet this need, monthly water operations from CalSim were disaggregated into daily water operations that are still bound by overall monthly limits.

The Millerton Daily Operations Model was used to simulate daily water operations of Millerton Lake. This model, developed in Excel, interpolated between the monthly CalSim boundary water operations of Millerton Lake (inflow, diversions, and long-term snowmelt flood releases) to generate a potential set of daily values that still meets the monthly operations boundaries. These daily operations were then used with a simplified flood routing procedure to generate a set of daily releases from Millerton Lake to the San Joaquin River.

### ***Reservoir Temperatures***

Daily Millerton Lake water operation data were used in a temperature model developed for the Upper San Joaquin River Basin Storage Investigation (USJRBSI), to generate daily release temperatures into the Friant-Kern Canal, Madera Canal, and San Joaquin River. The reservoir temperature model is a two-dimensional model based on the CE-QUAL-W2 (W2) modeling platform. The model uses daily water operations data from the daily disaggregation tool and historical meteorology to simulate temperatures every 6 hours from January 1, 1980, to September 30, 2003. This time period is shorter than the CalSim model time period to reduce the volume of output, allow acceptable model execution times, and still cover the full range of temperature operations expected over the longer CalSim time period.

### ***River Temperatures***

Daily Millerton Lake San Joaquin River release flows and temperatures were used in a temperature model of the San Joaquin River from Millerton Lake to the Merced River. The river temperature model, developed during the Settlement process, were routed releases through the system and computed the temperature at various locations. The river temperature model is based on the HEC-5Q modeling platform. The model performs two separate functions. The first, based on the HEC-5 model embedded in the HEC-5Q modeling platform, routes water through the San Joaquin River and bypass system from Millerton Lake to the confluence with the Merced River. This portion of the model handles the physical diversion of water between the Chowchilla, Eastside, and Mariposa bypasses and the San Joaquin River, local accretions and depletions along the channels, and hydrologic routing of water to develop daily flows throughout the system. The second function uses flows and historical meteorology to simulate temperatures every 6 hours from January 1, 1980, to September 30, 2003.

## **2.2.2 Other Models**

The following models are being used to evaluate the implementation of the SJRRP for the Draft Program Environmental Impact Statement/Report (PEIS/R), but were not used to evaluate implementation of the WY 2010 Interim Flows EA/IS.

### ***System Power***

System power operations, both power generation and power use for pumping, are being described using two power models. Long\_Term\_Gen and SWP\_Power are Excel-based models developed by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), and DWR to model CVP and SWP system power generation and pumping, respectively. These models use monthly water operations from CalSim to simulate monthly CVP and SWP plant and system power operations.

### ***Local Power***

Power operations at Friant Dam are being described using an Excel-based model of generation facilities at Friant Dam. This model is based on the power simulation methodology used in the USJRBSI. This model uses monthly water operations from CalSim to simulate power operations at Friant Dam.

### ***Vegetation***

System riparian vegetation is being evaluated using a vegetation model that links dominant river processes and the morphology of the channel to the dispersal, establishment, growth, expansion, and removal/mortality of riparian vegetation. The model, based on the SRH-1DV modeling platform, uses daily flow, sedimentation, and hydraulic information from other tools described in this section to simulate riparian vegetation response to SJRRP alternatives.

### ***River Hydraulics***

River hydraulics are important in developing the description of some of the resource areas. The river hydraulics are being evaluated using a hydraulic model based on the U.S. Army Corps of Engineers (USACE) Hydraulic Engineering Center – River Analysis System (HEC-RAS) modeling platform. This analysis is independent of daily flows from the SJRRP alternatives; it describes the relationship between flow and hydraulic parameters such as depth, top width, velocity, etc., that may be required for other analyses.

In response to comments received on the Draft EA/IS, DWR performed a cursory evaluation using HEC-RAS to determine potential flood impacts from WY 2010 Interim Flows. The results of this evaluation are presented in Attachment 6, “Cursory Evaluation of Flood Impacts from Interim Flows.”

### ***Sediment***

Sediment transport and deposition are being described using a model that links the dominant flow patterns and morphology of the channel to sediment conditions. The model, based on the HEC-RAS modeling platform, uses daily flow from other tools described in this section to simulate sediment behavior in the river channel resulting from SJRRP alternatives.

### ***Agricultural Economics***

Agricultural economics are being described using a model based on the Central Valley Production Model (CVPM) modeling platform. Based on the changes in water availability expected with each SJRRP alternative, CVPM predicts cropping patterns, land use, and water use in the Central Valley. These predictions are then used to calculate expected changes in net income resulting from each SJRRP alternative. This model uses CalSim water delivery output and groundwater levels from the regional groundwater tool.

### ***Regional Economics***

Regional economics are being simulated using a model based on the IMPLAN modeling platform. IMPLAN modeling uses a branch of economics known as input/output (I/O) analysis. I/O models are based on data tables that trace the linkages of interindustry purchases and sales within a given region, and within a given year. The I/O model yields “multipliers” that are used to calculate the total direct, indirect, and induced effects on jobs, income, and output generated per dollar of spending on various types of goods and services in the regional economic study area. This model uses output from the CVPM agricultural economics model, and could also use output from other models.

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## **3.0 Water Operations Modeling**

The CVP and SWP operate several large reservoirs and canals serving both agricultural and municipal clients throughout California. Water supplies in the State are governed by complex and layered cycles of supply and demand, legal conditions, transfer agreements, and regulations. Infrastructure for the CVP and SWP are tied together through regulations for the Delta – a conveyance feature and ecological system that is undergoing rapid changes in regulation.

### **3.1 CVP/SWP System Operation Modeling (CalSim)**

The Settlement includes specific flow requirements for the San Joaquin River below Millerton Lake. Meeting these requirements will require a substantial increase in the current release patterns for Millerton Lake. These changes in releases are expected to result in a significant change in Millerton operations. The water operations model was used to simulate revised Millerton operations, diversions into the Friant-Kern and Madera canals, and flow in the San Joaquin River.

Currently, portions of the San Joaquin River run dry during certain times of the year, effectively disconnecting Millerton operations from the Delta and the CVP/SWP systems. Implementation of the Settlement is intended to reestablish a connection between the Friant Division system and the rest of the Central Valley water system, including the CVP and SWP. Changes to the pattern, volume, and timing of releases along the San Joaquin River are likely to affect water releases throughout the Central Valley. It will be necessary for the SJRRP to evaluate subsequent, reactive operation changes of the CVP, SWP operations, and other water Central Valley water systems, and their associated impacts.

Evaluation of the impacts to these systems, and to the environment, required detailed information on water operations resulting from the release of WY 2010 Interim Flows. CalSim was selected as the basis for evaluating the impacts of WY 2010 Interim Flow releases on the water supply and water operations of these systems. Water operations under the Proposed Action were compared with water operations under the No-Action Alternative in this EA/IS for two distinct purposes. One purpose was to evaluate direct impacts to water operations, including the following:

- Millerton Lake elevation, storage, and release
- Diversions to the Friant-Kern and Madera canals
- Flow in the downstream San Joaquin River
- Reservoir operations and streamflows on San Joaquin tributaries
- Delta inflow
- CVP/SWP operations, including both Sacramento River Valley and Delta operation impacts

Results of water operations modeling were also used to supply input data required for other analysis areas in the evaluation of WY 2010 Interim Flows for the EA/IS, including the following:

- Regional groundwater
- Water quality

### 3.1.1 Model Description

CalSim is a planning model designed to simulate operations of the CVP and SWP reservoirs and water delivery system for current and future facilities, flood control operating criteria, water delivery policies, and instream flow and Delta outflow requirements. CalSim is the best available tool for modeling the CVP and SWP, and is the only systemwide hydrologic model being used by Reclamation and DWR to conduct planning and impact analyses of potential projects.

CalSim is a level of development (LOD)-type model. It simulates operation of the CVP and SWP for a set of physical conditions and regulatory requirements that is the same for each year. The model simulates these conditions using 82 years of historical hydrology adjusted to reflect the constant LOD, from WY 1922 through 2003. CalSim operates the CVP and SWP using a mixed-integer linear programming solver that maximizes an objective function for each month of the simulation.

CalSim modeling conducted for this project is built on the Common Assumption Common modeling package (CACMP) Version 9B (V9B), developed jointly by Reclamation and DWR. At this time, V9B is the most appropriate representation of system facilities and operations for this evaluation. Project-specific modifications to this version of CalSim were required to simulate the SJRRP; these modifications are documented throughout this appendix.

CalSim is designed to simulate the effects of various regulatory requirements by running multiple “steps.” CalSim steps simulate the operations of the CVP and SWP system under select regulatory requirements and agreements. The model is run for each step for 1 year. End-of-year conditions from the final step become input for the first step of the next year. The version 9B model contains the following five steps:

1. **D-1641** – State Water Resources Control Board (SWRCB) Water Right Decision 1641 (D-1641) was issued in 1999, revised in 2000, and specifies how the *1995 Water Quality Control Plan (WQCP)* is to be implemented. D-1641 provides both flow and water quality requirements at key locations in the Delta. Many requirements in D-1641 are based on the Sacramento Valley water year-type, which is calculated based on the current and previous year’s unimpaired runoff of the Sacramento, Feather, Yuba, and American rivers. D-1641 is the current basis for most regulatory requirements governing the Delta, which in turn affects how the CVP and SWP operate upstream reservoirs and Delta export pumps. CalSim simulates the system under these regulations and stores the resulting operations for comparison and use with results from other steps.

2. **D-1485** – SWRCB Water Right Decision 1485 (D-1485) was replaced by D-1641 and is no longer used for Delta standards or for operation of the CVP or SWP. However, Section b(2) of the Central Valley Project Improvement Act (CVPIA) dedicated 800 thousand acre-feet (TAF) of water to be made available for environmental purposes. This “b(2)” water is split into two separate accounts: nondiscretionary and discretionary. Nondiscretionary b(2) water, which can constitute all or part of the 800 TAF, is the difference in water costs (either additional releases from upstream reservoirs or water available but not exported from the Delta) to meet the more stringent requirements of D-1641 instead of the previous requirements of D-1485. Therefore, CalSim simulates operations of the system under both D-1641 and D-1485 for the purpose of determining this difference in water costs.
3. **CVPIA b(2)** – The b(2) step compares operations of the system under both D-1641 and D-1485 to determine the nondiscretionary portion of CVPIA b(2) water. The use of the remaining volume of water, the discretionary account, is simulated in the b(2) step. Discretionary b(2) water may include additional wintertime releases from upstream reservoirs or export reductions in the weeks before and after the reductions that occur in the spring as part of the Vernalis Adaptive Management Plan (VAMP). CalSim results at the end of the b(2) step depict operation of the system under D-1641 and CVPIA b(2). These results are used as the basis for simulation of additional operations in the following steps.
4. **Conveyance** – The conveyance and transfer steps of CalSim are primarily used to simulate specific aspects of project operations, as opposed to regulatory requirements simulated in the preceding steps. CVPIA b(2) actions and costs are “fixed” to those simulated in the b(2) step.
5. **Transfer** – The CalSim transfer step layers Stage 2 water transfers onto operations, and simulates Joint-Point of Diversion operations for the CVP and SWP (Joint-Point). Stage 2 water transfers are region-specific acquisitions made by municipal water users to supplement project water supplies. Stage 2 transfers are private party transfers moved through the Delta as a last priority for export capacity. Joint-Point operations increase the flexibility of CVP and SWP exports by allowing both projects to use available export capacity at each other’s pumps. The transfer step also includes wheeling CVP water for Cross Valley Canal contractors at the Harvey O. Banks Pumping Plant (Banks Pumping Plant).

For the purpose of this analysis, a Conveyance single-step study was used with the addition of Joint-Point and Cross Valley Canal wheeling from the Transfer step. The reason is that the Conveyance step is the last point where a dynamic link between San Joaquin River operations and the rest of the CVP/SWP systems exists. (At the Transfer step, all San Joaquin River operations have already been predetermined at the Conveyance step.) Since potential exists for some WY 2010 Interim Flows to be captured downstream from Vernalis and returned to the Friant Division using CVP and SWP facilities, the dynamic link needs to be maintained.

The other option was to run a multistep study, with all key WY 2010 Interim Flows operations still occurring in the Conveyance step. This would have required significantly more modeling effort with no significant change in results or conclusions. The single-step Conveyance study lacks a dynamic CVPIA b(2) operation and Stage 2 water transfers. As for b(2), upstream releases and export limits are applied just as in the CACMP V9B baseline; however, the WY 2010 Interim Flows might alter the costs of such actions. With the changes in costs, a dynamic b(2) operation might cause different CVPIA b(2) action decisions. In the case of the Stage 2 transfers, they occur during the summer months of droughts.

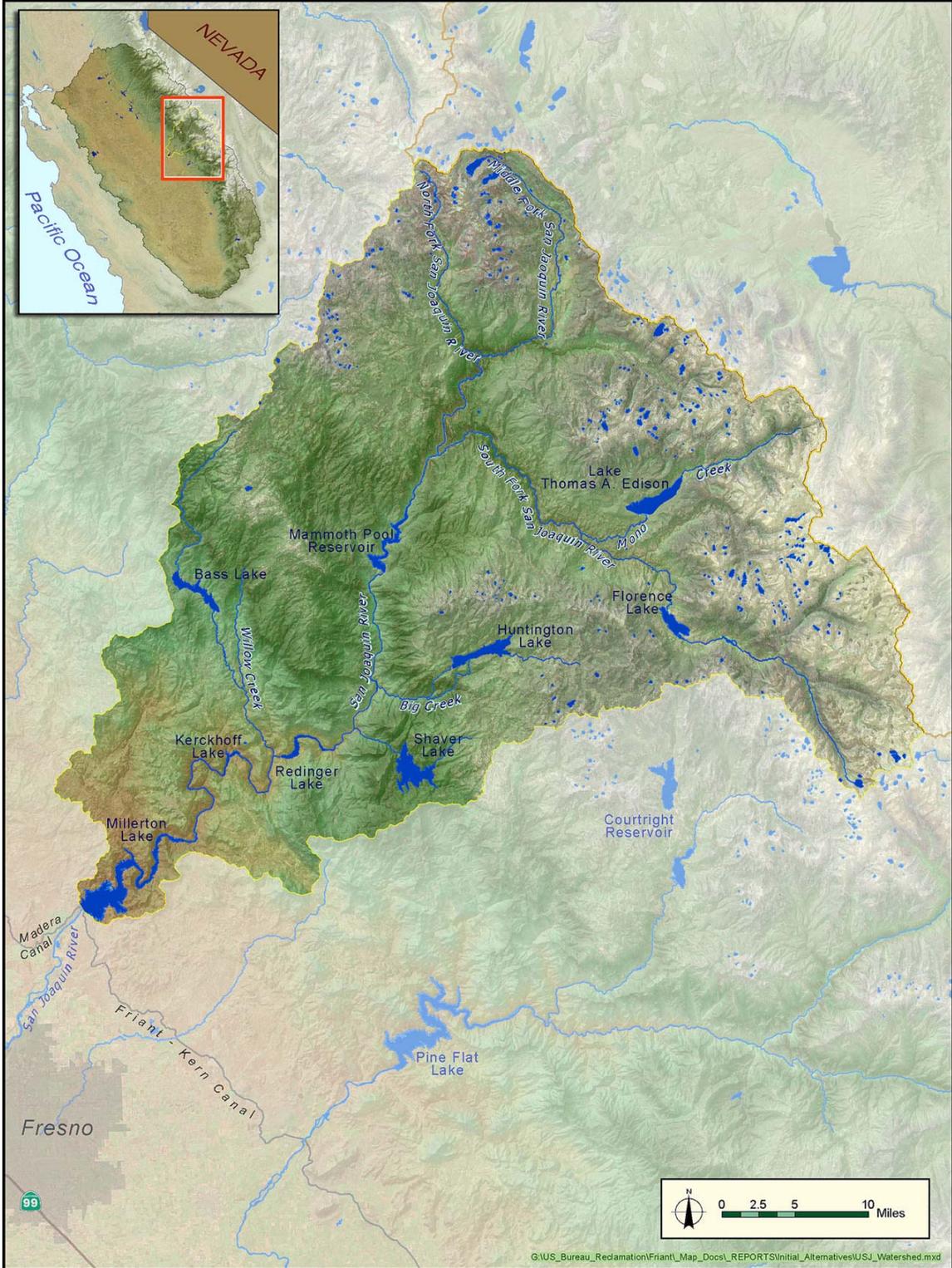
### ***Friant Division***

CalSim incorporates a dynamic operation of Friant Division water diversions and operations. Canal diversions vary from year to year based on an annually variable water supply, and considers the current protocols for providing three categories of water supply. Under the current contracts (without implementing WY 2010 Interim Flows) the Class 1 water supply is considered the “firm supply” from the Friant Division and amounts to the first 800 TAF of yield from the San Joaquin River and reservoir storage. Class 2 deliveries are developed after Class 1 deliveries are met. These deliveries are highly variable because of variable hydrology. Deliveries that occur when water is unstorable are also modeled. Monthly distribution of the annual diversion is based on historical delivery practices of the contractors. Minimum required releases below Friant Dam for riparian and contractor users are modeled as a constant annual requirement, consistent with recent records of operations.

Flood control operations for Millerton Lake and the lower San Joaquin River are based on rain-flood space reservation requirements specified by USACE. Flood control operations during the snowmelt runoff period recognize the competing objectives of water supply and flood control. The operations attempt to maximize water supply carryover storage (into summer) while reducing the potential for downstream flooding.

### ***San Joaquin River Inflow to Millerton Lake***

Above Friant Dam, the San Joaquin River drains an area of approximately 1,676 square miles and has an average annual unimpaired runoff of 1,700 TAF. The median historical unimpaired annual runoff is 1,400 million acre-feet (MAF), with a range of 400 TAF to 4,600 TAF. Several reservoirs in the upper portion of the San Joaquin River watershed, including Mammoth Pool and Shaver Lake, regulate runoff primarily for hydroelectric power generation. These storage facilities have a combined storage capacity of approximately 620 TAF. Operation of these reservoirs affects inflow to Millerton Lake. Figure 3-1 identifies the San Joaquin River watershed upstream Millerton Lake.



**Figure 3-1.**  
**San Joaquin River Watershed Upstream from Millerton Lake**

Millerton Lake inflow is derived from the modeling output of the Upper San Joaquin River Basin Model (USAN), which simulates current San Joaquin River operations from headwaters to Millerton Lake (Reclamation 2000a). USAN is a daily time step model, and its Millerton Lake inflow data have been converted to monthly average values for CalSim. The USAN simulation incorporated into CalSim is referred to as the “Base Plan” (Reclamation 2000b). Reservoirs simulated by USAN are labeled in Figure 3-1.

### ***Modifications of CACMP V9B CalSim***

The CACMP V9B CalSim baseline was modified to allow SJRRP operations to be implemented.

A sectional representation of the Friant-Kern Canal was added with contractor demands and diversions disaggregated by Water Management Area (WMA) to provide canal capacity.

Class 1 and Class 2 deliveries to the Madera and Chowchilla irrigation districts were reduced when Hidden and Buchanan dams were spilling. In V9B, rather than holding water in Millerton Lake to be delivered at a later date, the water was sometimes mistakenly reallocated to other contractors. This was fixed for the WY 2010 Interim Flows baseline and studies.

Some of the exchange and refuge diversions were being taken from the Mendota Pool that are actually taken at Sack Dam, downstream from Mendota Pool. With WY 2010 Interim Flows, the location of these diversions is important because Delta-Mendota Canal (DMC) and San Joaquin River water mix upstream from Sack Dam. This would, in turn, affect water quality downstream from Sack Dam. These diversions were moved downstream to the node representing Sack Dam.

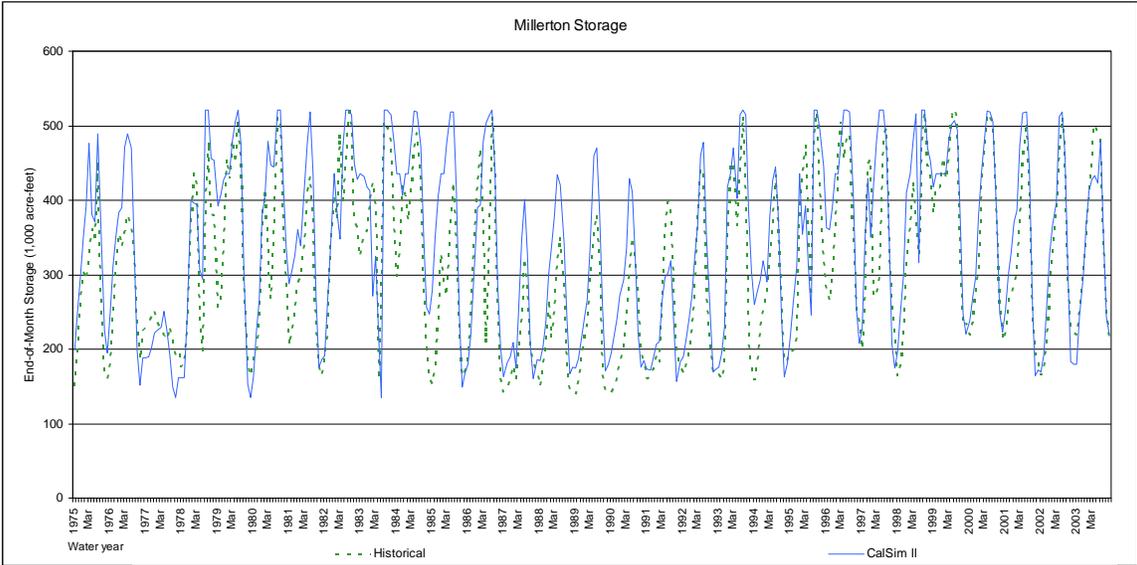
### **3.1.2 Suitability of CalSim**

CalSim, and explicitly the component of CalSim that depicts the San Joaquin River basin, is currently being used in ongoing water supply planning efforts of Reclamation and DWR, including the USJRBSI, Los Vaqueros Reservoir Expansion Investigation, and others. Use of CalSim for this analysis provides consistency among the several planning initiatives throughout the State.

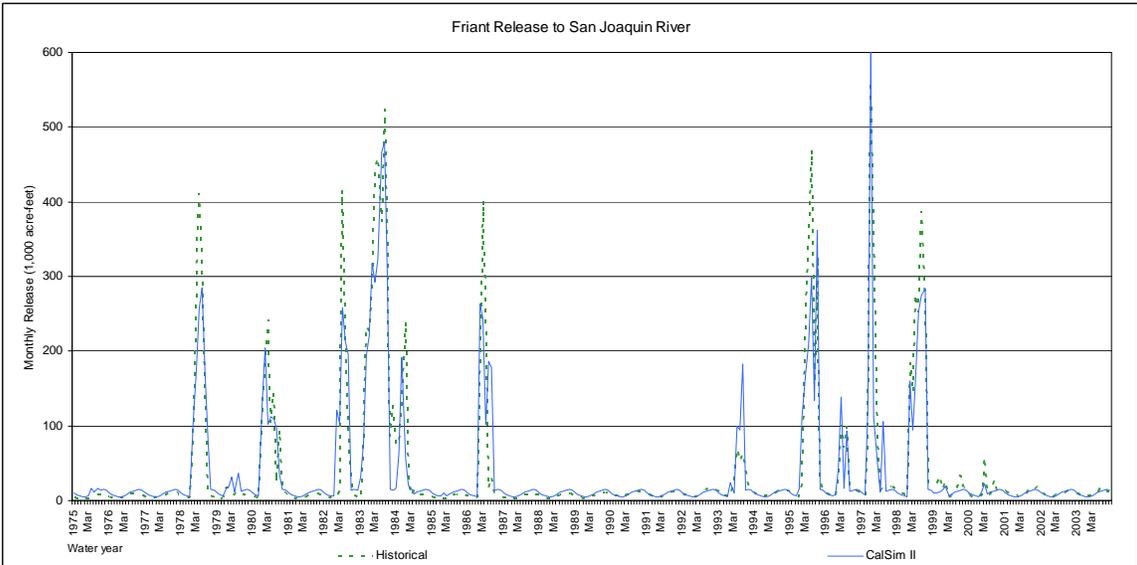
Representation of the San Joaquin River within CalSim has undergone extensive Peer Review and testing (CALFED 2006). The specific model logic and algorithms embedded in studies for the SJRRP contain several enhancements specifically needed for evaluation of the SJRRP. Enhancements are summarized in Section 3.1.1.

The Friant Division’s water delivery logic is included in CalSim. The following plots compare historical operations to CalSim simulation results. These plots provide comparisons between 1975 and 2003.

Figures 3-2 through 3-5 compare historical and simulated Millerton Lake storages, river releases, and canal diversions for the Friant Division. While noticeable differences occur between historical and simulated annual delivery and river release volumes for some time periods, the differences are likely due to the inability of the model to reflect discretionary and intermittent actions, such as flood management and canal maintenance.

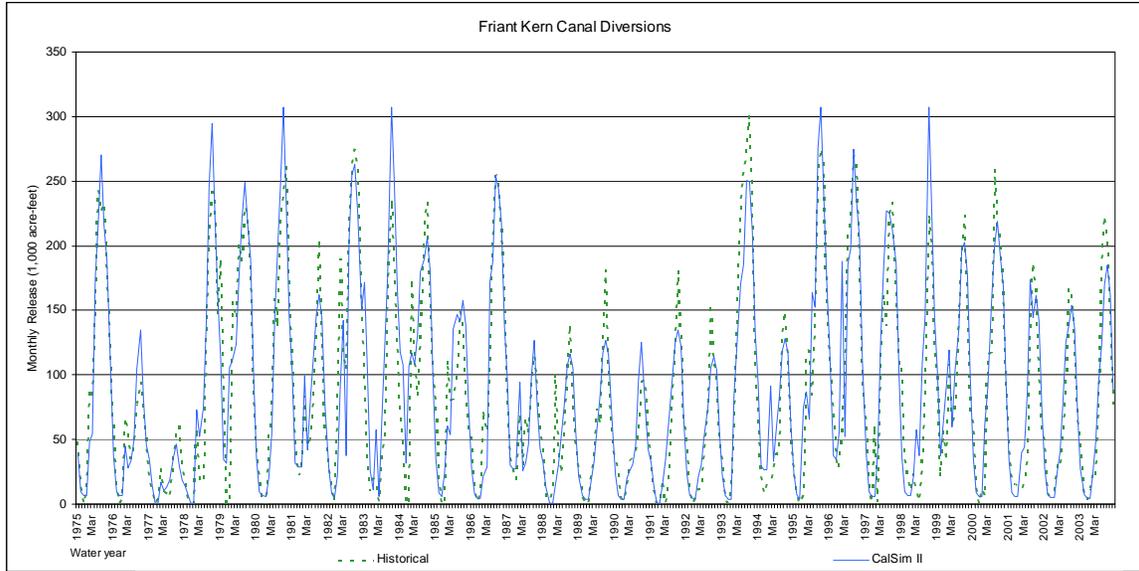


**Figure 3-2.**  
**Millerton Lake Storage**

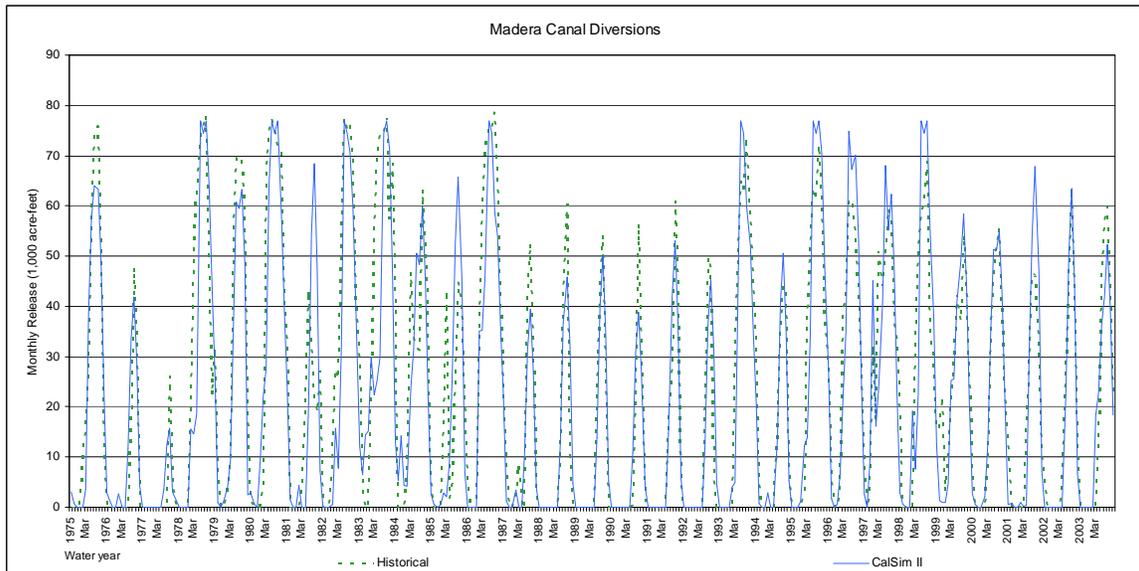


**Figure 3-3.**  
**Total Friant Dam River Releases**

# San Joaquin River Restoration Program



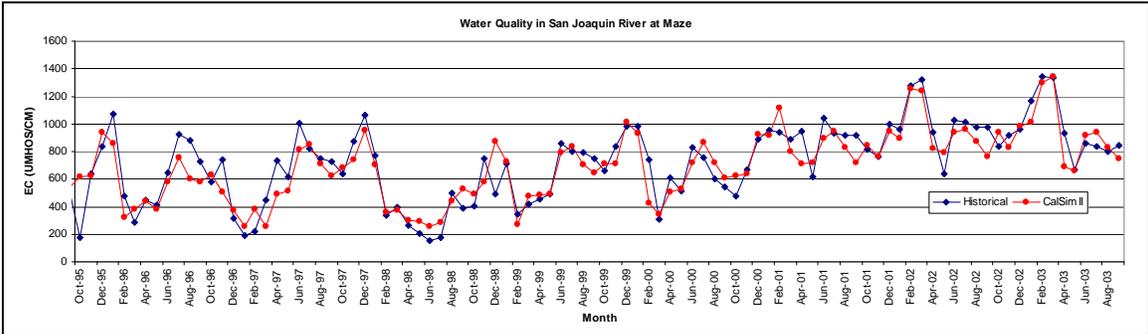
**Figure 3-4.**  
**Friant-Kern Canal Diversions**



**Figure 3-5.**  
**Madera Canal Diversions**

Review suggested that one aspect of CalSim that could require further refinement is the water quality depiction of the San Joaquin River. Of particular concern is the calculated sensitivity at the Stanislaus River confluence due to the San Joaquin River’s influence on New Melones Project operations.

Figure 3-6 is a plot of San Joaquin River electrical conductivity (EC) and San Joaquin River flow, as depicted by CalSim and recorded for October 1995 through September 2003. This graphic is representative of the accuracy of CalSim in depicting flow and water quality conditions in the San Joaquin River upstream from the Stanislaus River confluence, a location typically referred to as the “Maze” Boulevard crossing of the river. A flow and quality recorder exists at this location and provided information for calibrating CalSim. CalSim provides an adequate simulation of San Joaquin River flow and water quality conditions, and is the best available tool for such a depiction (CALFED, 2006). The water quality components were not modified for this WY 2010 Interim Flows EA/IS.

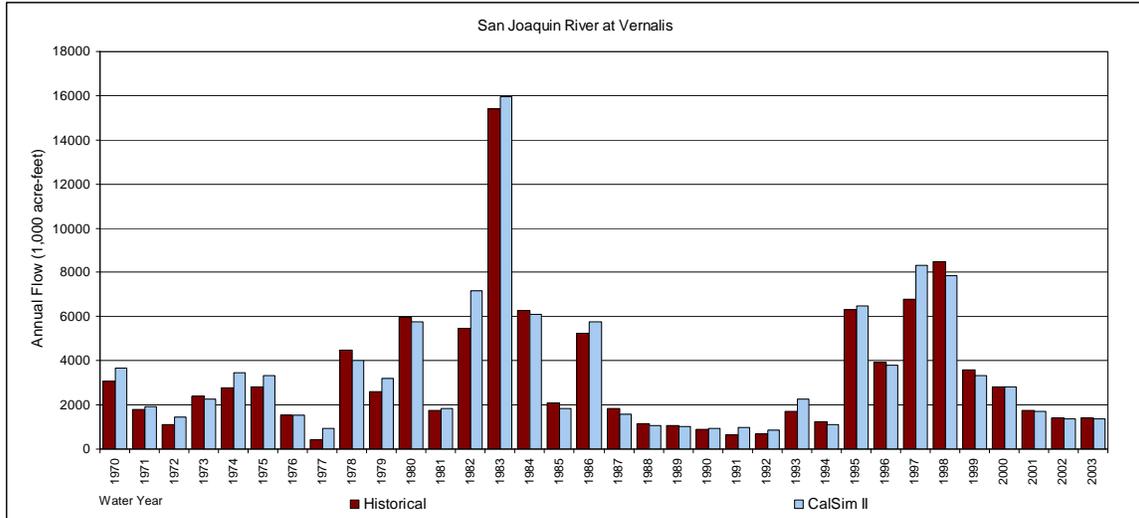


**Figure 3-6.**  
**Electrical Conductivity – San Joaquin River at Maze**

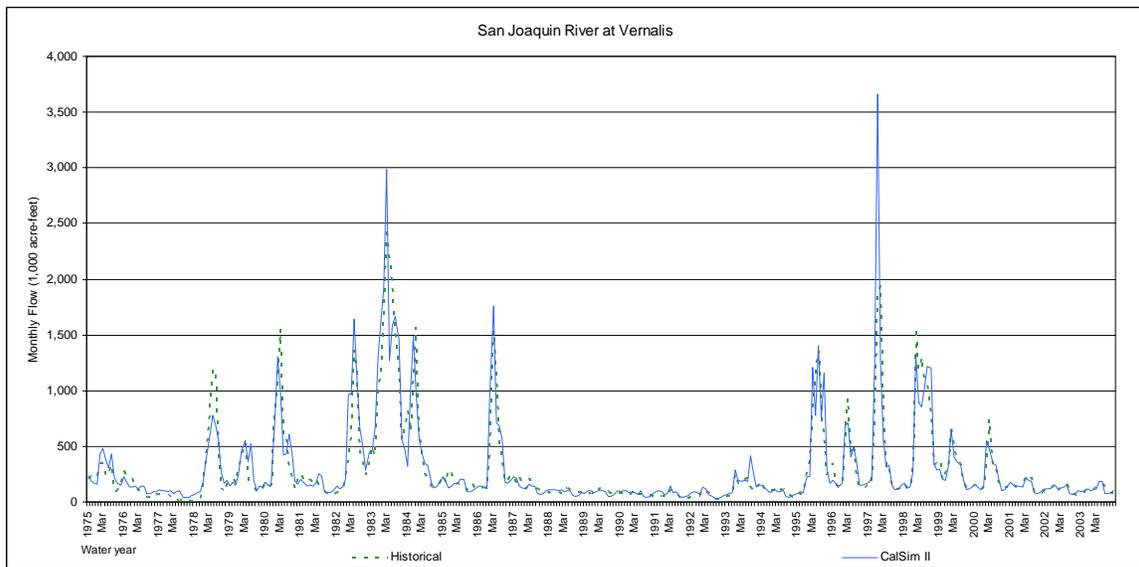
CalSim is also an appropriate tool to analyze the interaction between San Joaquin River flow and quality conditions, as affected by WY 2010 Interim Flows and operation of the New Melones Project.

San Joaquin River Restoration Program

Figure 3-7 compares the annual historical and simulated flow at Vernalis. The comparison of simulated and historical monthly San Joaquin River flows at Vernalis is identified in Figure 3-8.



**Figure 3-7.**  
**Annual San Joaquin River Flow Volume at Vernalis**



**Figure 3-8.**  
**San Joaquin River Flow Volume at Vernalis**

### 3.1.3 Modeling Assumptions

A complete description of CalSim assumptions requires descriptions of how operations for both the CVP and SWP throughout California are simulated. The CACMP V9B CalSim baseline has a well-documented series of tabulated assumptions that are presented in the Water Operations Modeling Output – CalSim Attachment to this appendix.

#### ***Existing Minimum San Joaquin River Flow Requirement***

For all CalSim models runs, a number of modifications were made to capture SJRRP operations between Friant Dam and the Merced River confluence. Existing releases from Friant Dam to the San Joaquin River are normally limited to the amount necessary to maintain diversions by riparian and contractor users below Friant Dam to a location near Gravelly Ford. Water diverted to the fish hatchery below Friant Dam and returned to the river partially serves that purpose. Review of historical operation records (Reclamation monthly reservoir operation reports) provided guidance in estimating the minimum downstream release. From an analysis of the historical record (1990 – 1994) for periods when no flood control releases were made, an annual release of 116.7 TAF was estimated to be the current minimum release necessary to meet downstream diversions (including seepage). Table 3-1 illustrates the assumed monthly distribution of this release requirement.

**Table 3-1.  
Estimated Friant Dam Minimum River Release Requirement (TAF)**

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
10.1	7.4	6.7	4.5	5.0	6.6	9.0	10.9	12.9	14.4	15.7	13.4
Total 116.7 TAF											

Key:  
TAF = thousand acre-feet

#### ***Existing Level of Development***

CalSim simulations at a projected LOD are used to show how the modeled water system might operate with an assumed physical and institutional configuration imposed on a long-term sequential hydrologic trace. An existing LOD study assumes that current land use, facilities, and operational objectives are in place for each year of simulation (1922 through 2003). The results are a depiction of the current environment, which provides a basis for comparing project effects for the CEQA analysis.

Parameters used to describe existing LOD hydrologic conditions and operating rules for the San Joaquin River basin water system were developed using recent historical data and current established operational objectives and requirements. These criteria are described in the *Draft CalSim-II San Joaquin River Model* documentation (Reclamation, 2007). The results provide a CalSim simulation of the system depicting current operations.

Drainage from the San Joaquin River. Drainage and return flows from the San Joaquin River for the existing LOD are described in the *Draft CalSim-II San Joaquin River Model* documentation, particularly in the discussion of the water quality module (Reclamation, 2007). Several of the salinity (EC) characteristics of the drainage and return flow

components are explicitly modeled in CalSim. One such explicit component is the discharge of the Grassland Bypass Project. This project, now incorporated into the West Side Regional Drainage Plan, continues to operate to reduce selenium discharges to the San Joaquin River (San Joaquin River Exchange Contractors Water Authority et al., 2003). The existing LOD discharge is assumed to be approximately 30 TAF per year.

**National Marine Fisheries Service 2009 Operations Criteria and Plan Biological Opinion.** The National Marine Fisheries Service (NMFS) 2009 Operations Criteria and Plan (OCAP) Biological Opinion (BO) and other recent BOs for Delta smelt, salmon, steelhead and green sturgeon were not included in the modeling. No accepted interpretation of how these should be implemented in the CalSim modeling is currently available to allow analysis.. These BOs are expected to restrict pumping in both the No-Action Alternative and Proposed Action, and to reduce the opportunity for Delta recapture and recirculation of WY 2010 Interim Flows. The BOs will have no impact on San Joaquin River operations in the Restoration area. All real time operations will comply with these BOs as well as all other applicable regulations at the time of implementation of the WY 2010 Interim Flows.

### **3.1.4 Proposed Action Formulation**

The Proposed Action was implemented at the existing LOD. It includes the WY 2010 Interim Flows minimum Friant Dam release requirements, as derived using Method 3.1, transformation pathway “alpha,” and 1,300 cubic feet per second (cfs) conveyance capacity constraints for Reaches 2B and 3. Complete descriptions of Method 3.1 and the alpha pathway are provided in Appendix C. Table 3-2 presents maximum flows under the WY 2010 Interim Flows, by reach.

#### ***WY 2010 Interim Flow Implementation***

WY 2010 Interim Flows would be implemented as a minimum required release from Friant Dam. The WY 2010 Interim Flows release schedule was preprocessed using Method 3.1, and includes the 116.7 TAF annual preflow release for downstream riparian diversions and losses. In March, April, and November, the WY 2010 Interim Flows schedule calls for flow pulses measured in days and weeks. Day-weighted average flows for the months of March and November were used for the monthly time step simulation. However, because of synchronization of the April WY 2010 Interim Flows with downstream releases for VAMP, a split-month operation was implemented to quantify downstream impacts.

Scheduled WY 2010 Interim Flow releases were incorporated into Friant Dam water supply and flood control operations. Planned releases were used to reduce the forecasted water supply for Class 1 and Class 2 deliveries. Surplus forecasts also took scheduled WY 2010 Interim Flows into account, thereby reducing snowmelt releases and Section 215 deliveries.

**Alternatives Assumptions**

For the Proposed Action, key assumptions are as follows:

- WY 2010 Interim Flow releases (Table 3-2) are as developed with Method 3.1 and Conveyance capacity constraints of 1,300 cfs for Reaches 2B and 3.
- Between Friant Dam and the confluence of the Merced River, WY 2010 Interim Flows are reduced by riparian diversions and instream losses.
- The San Joaquin tributary river systems, including, the Stanislaus (and New Melones Reservoir), Tuolumne, and Merced, are allowed to respond to changes in flow and water quality at Vernalis.
- No WY 2010 Interim Flows are recaptured, diverted, or recirculated for direct return to the Friant Division because specific operational characteristics of these actions and required agreements for implementation have not been formulated.
- CVP and SWP operations respond to changed Delta inflow at Vernalis according to existing physical and regulatory constraints and operating rules. This includes both Delta exports and south-of-Delta CVP/SWP storage, conveyance, and delivery systems. This assumption means that any additional Delta inflow is modeled as being available for CVP/SWP export and delivery. Additional Delta inflow that is not exported will become Delta outflow.

**Table 3-2.  
Maximum Flows Under the Proposed Action**

Beginning Date	Ending Date	Maximum Flows Under the Proposed Action <sup>1</sup> at Locations in the Restoration Area (cubic feet per second)									
		Head of Reach 1 <sup>3</sup>	Head of Reach 2A <sup>4</sup>	Head of Reach 2B <sup>5</sup>	Head of Reach 3 <sup>6</sup>	Head of Reach 4A <sup>7</sup>	In Reach 4B1	In Reach 4B2	In Eastside Bypass <sup>7</sup>	Head of Reach 5	Merced River Confluence <sup>8</sup>
10/1/2009	10/31/2009	350	195	115	715	115	0	115	115	115	415
11/1/2009	11/6/2009	700	575	475	1,075	475	0	475	475	475	775
11/7/2009	11/10/2009	700	575	475	1,075	475	0	475	475	475	775
11/11/2009	11/20/2009	350	235	155	755	155	0	155	155	155	555
11/21/2009 <sup>2</sup>	1/31/2010 <sup>2</sup>	120	5	0	0	0	0	0	0	0	0
2/1/2010	2/28/2010	350	255	175	775	175	0	175	175	175	675
3/1/2010	3/15/2010	500	375	285	885	285	0	285	285	285	785
3/16/2010	3/31/2010	1,500	1,375	1,225	1,300	1,225	0	1,225	1,225	1,225	1,700
4/1/2010	4/15/2010	1,620	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
4/16/2010	4/30/2010	1,620	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
5/1/2010	6/30/2010	1,660	1,475	1,300	1,300	1,300	0	1,300	1,300	1,300	1,700
7/1/2010	8/31/2010	350	125	45	645	45	0	45	45	45	320
9/1/2010	9/30/2010	350	145	65	665	65	0	65	65	65	340

Notes:

- <sup>1</sup> Regulated nonflood releases from Friant Dam and deliveries by the Delta-Mendota Canal, exclusive of agricultural return flows and natural drainage.
- <sup>2</sup> No Water Year 2010 Interim Flows during this period.
- <sup>3</sup> Assumes up to 230 cubic feet per second diverted by instream water right holders, consistent with Exhibit B of the Settlement.
- <sup>4</sup> Assumes up to 200 cubic feet per second lost through infiltration, consistent with Exhibit B of the Settlement.
- <sup>5</sup> Assumes up to 2,621 cubic feet per second maximum diversion capacity to water right holders in the Mendota Pool.
- <sup>6</sup> Assumes up to 600 cubic feet per second released to Reach 3 from Mendota Pool for diversion to Arroyo Canal.
- <sup>7</sup> Assumes up to 25 percent of flow lost through infiltration downstream from Sack Dam, and up to 80 cubic feet per second diverted at wildlife refuges.
- <sup>8</sup> Assumes accretions from Mud and Salt sloughs in Reach 5, consistent with Exhibit B of the Settlement.

## 3.2 Millerton Lake Daily Operation Modeling

As mentioned, the SJRRP used the monthly time step model CalSim to model basic water operations anticipated under the Proposed Action to determine how well they would meet the Water Management Goal. Once basic water operations were determined, they underwent additional analysis to determine how well they would meet the Restoration Goal, and to support evaluation of potential impacts of the WY 2010 Interim Flows. Much of this further analysis required estimates of water operations on a shorter, daily time step.

A transparent, consistent, repeatable process to estimate a reasonable set of daily water operations that maintains the overall water operational constraints from CalSim results was required to perform the analysis, and facilitate comparisons between the No-Action Alternative and Proposed Action.

The USJRBSI developed an Excel-based spreadsheet to disaggregate monthly CalSim water operations into a daily set of water operations for use in further analysis. These daily values are not intended to represent proposed or optimal daily water operations. Instead, USJRBSI analyses represent a potential set of daily water operational values that can be used for further analysis in support of comparisons between the No-Action Alternative and Proposed Action.

The USJRBSI baseline CalSim simulation includes the Settlement flow schedule. This simulation was selected for use in the evaluation, modification, and verification of the spreadsheet for use in SJRRP modeling scheme. All values, tables, and figures presented in this report are based on this CalSim simulation and are presented here for example purposes only, and may not represent the final values used in the EA/IS analysis.

Water operations data from 1983 of the USJRBSI baseline CalSim simulation were used to generate examples of the procedure followed for each year. This year was chosen because it is a very wet year, and includes flood releases from Millerton Lake.

### 3.2.1 Model Description

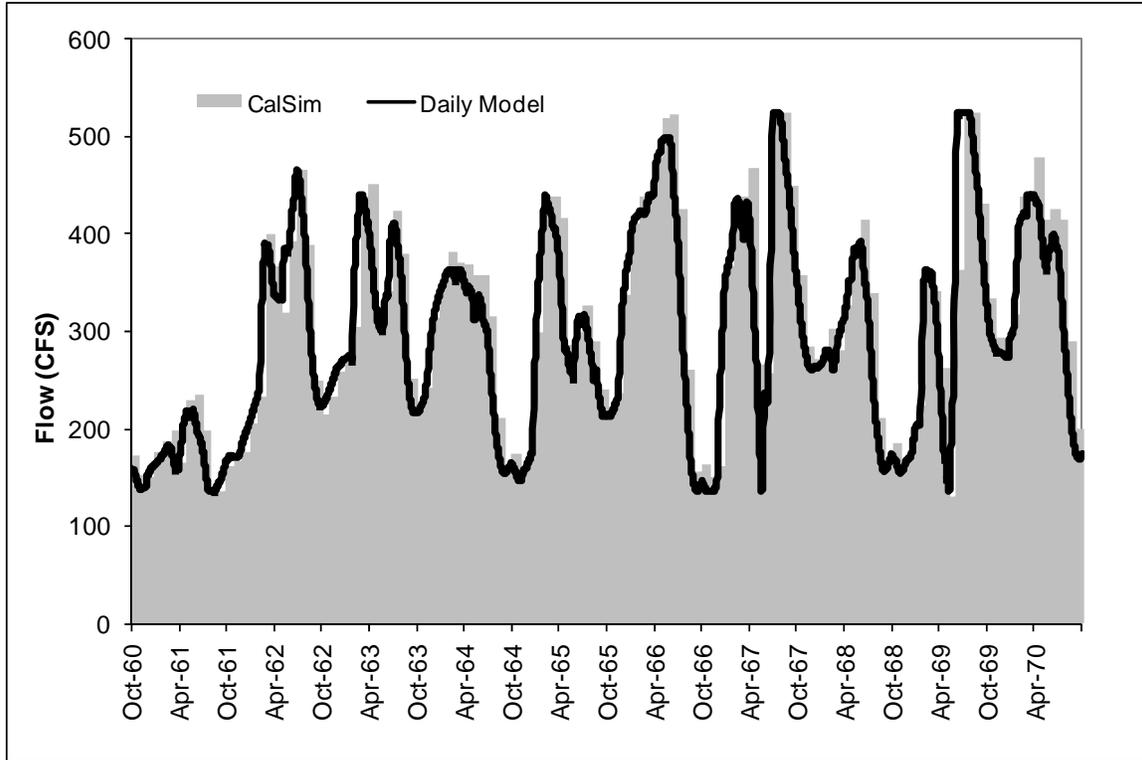
The spreadsheet tool generates the daily set of water operations using a two-step process:

- Monthly-to-daily interpolation process
- Simplified daily rainflood operation

#### ***Initial Restoration Modifications***

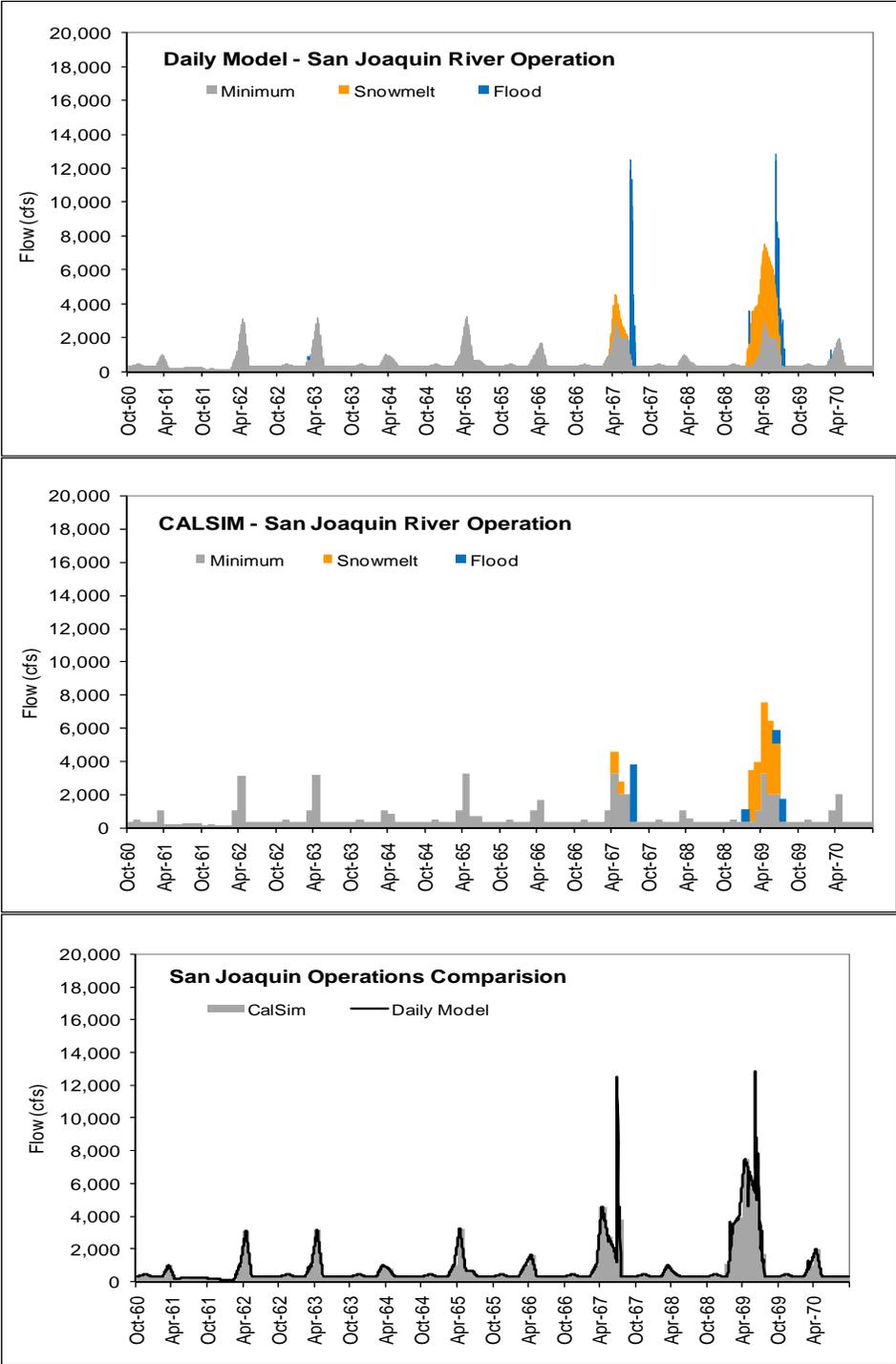
As used in the USJRBSI, the spreadsheet includes the capability to include the potential Fine Gold and Temperance Flat reservoirs evaluated as part of that project. Although these reservoirs can be “turned off” in the tool for evaluations of Millerton Lake alone, the spreadsheet was extremely large and complex with long recalculation times, and a greatly increased chance of error. Therefore, the spreadsheet tool was modified to remove the Fine Gold and Temperance Flat reservoirs.

A number of additional charts were added to allow the spreadsheet to verify that the final computed daily values were comparable to monthly CalSim input values. Figure 3-9 is an example of a chart showing how the CalSim monthly values correspond to the final daily values.



**Figure 3-9.**  
**Example Millerton Lake Storage Operation Monthly - to - Daily Comparison**

Figure 3-10 shows three example charts comparing the San Joaquin River release component computation and the final total San Joaquin River release between the CalSim monthly values and the final daily values. There are similar charts for the Friant-Kern Canal and Madera Canal diversions.



**Figure 3-10.**  
**Example Millerton Release to the San Joaquin River Monthly - to - Daily Comparison**

### 3.2.2 Model Assumptions

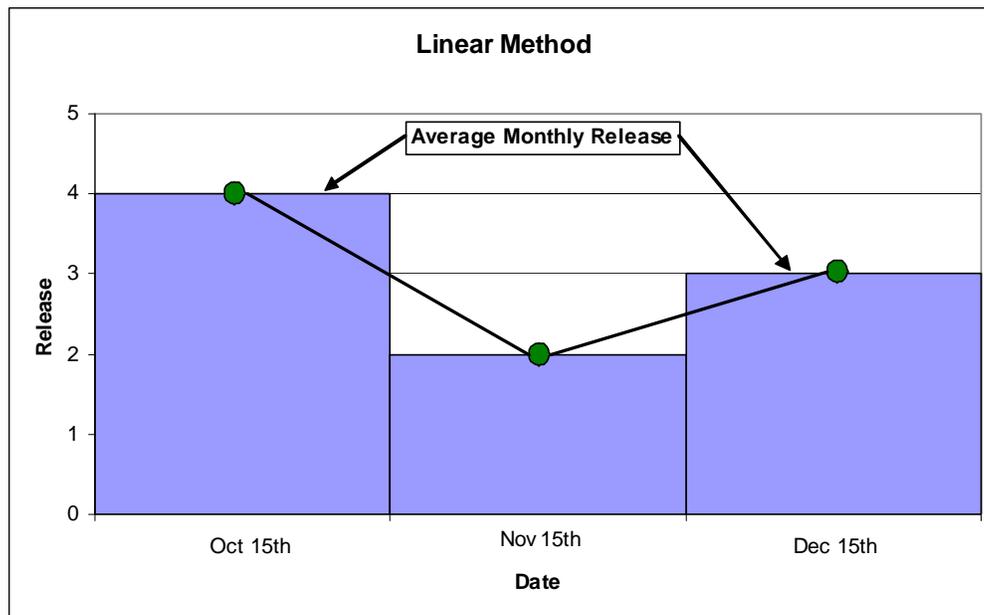
Several assumptions are made in the spreadsheet tool to produce daily time-step Millerton Lake operations simulations. These include, as described below, assumptions regarding interpolation processes, flood operations, and flow routing.

#### ***Monthly-to-Daily Interpolation Process***

Simplified daily rainflood operations require boundary or input data on a daily basis. These data include the following:

- San Joaquin River inflow to Millerton Lake
- Friant-Kern Canal diversion
- Madera Canal diversion
- Snowmelt flood control release
- San Joaquin River minimum flow release (Settlement flow schedule)
- Millerton Lake evaporation
- Mammoth Pool storage

Initial boundary condition data are extracted from the appropriate CalSim simulation. These CalSim results are converted from a monthly rate into a daily rate through dividing the volume by the number of the days in the month. It is assumed that this daily rate is the rate on the 15<sup>th</sup> of each month, and that the final daily rate changes linearly from the middle of 1 month to the middle of the next. The linear change prevents a stair-step-type operation wherein the rate changes dramatically at the beginning of each month. The change for the second half of the month, from the 16<sup>th</sup> to the end of the month, is adjusted to account for the different number of days in this half of the different months. Figure 3-11 depicts this process.



**Figure 3-11.**  
**Conceptual Depiction of Monthly - to - Daily Interpolation**

It is recognized that this method sets the minimum and peak daily values at the mean monthly value and may not capture the expected minimum and peak daily values; however, this method provides a reasonable level of detail for the evaluations of the No-Action Alternative and Proposed Action. The following sections describe how the interpolation process is applied to specific boundary condition data.

**San Joaquin River Inflow to Millerton Lake.** The spreadsheet tool uses daily Millerton Lake inflows from the USAN model. As mentioned, the USAN model is an operations model of the upper San Joaquin River basin typically used to predict inflows to Millerton Lake. These daily inflows were summed and used to generate monthly inflows for use in CalSim. Since daily inflows are available, no interpolation from monthly to daily values is required.

**Friant-Kern Canal Diversion.** The Friant-Kern Canal in CalSim only diverts for delivery; there is no flood release component. The simplified daily rain-flood operations may add flood releases to the Friant-Kern Canal.

**Madera Canal Diversion.** The Madera Canal diversion in CalSim includes both the actual diversion for delivery, and diversion of flood control releases to protect the San Joaquin River. The interpolation process is only performed on the Madera Canal diversion for delivery. Diversions of flood control releases are recomputed in the simplified daily rain-flood operations.

**Snowmelt Flood Control Release.** The snowmelt flood release in CalSim is determined by predicting the expected inflows to Millerton Lake from February 1 to June 30, subtracting the expected diversions for the same period, and releasing the difference over the period in an attempt to minimize spills from the reservoir. CalSim monthly values are disaggregated using the interpolation process.

**San Joaquin River Minimum Flow Release.** San Joaquin River minimum flow requirements are specified as mean monthly values for use by CalSim. These CalSim monthly values are disaggregated using the interpolation procedure.

**Millerton Lake Evaporation.** Millerton evaporation is computed in CalSim based on an assumed evaporation rate and mean monthly surface area. These CalSim monthly values are disaggregated using the interpolation procedure.

**Mammoth Pool Storage.** Flood control operations at Millerton Lake can take credit for up to 85 TAF of available storage capacity in the upstream Mammoth Pool Reservoir. Daily Mammoth Pool storage is obtained from the USAN model and input into the spreadsheet tool as a data time series (TS) to allow the spreadsheet tool to compute the available credit space at Mammoth Pool.

#### ***Simplified Daily Rain-Flood Operation***

Rain-flood routing is performed assuming that the total controlled release from Millerton Lake is the sum of all the nonrain-flood releases (Madera Canal delivery, Friant-Kern Canal delivery, San Joaquin River minimum flow requirement, and San Joaquin River snowmelt flood release).

If making this release would reduce Millerton Lake storage below a minimum allowable storage of 135 TAF, then the total release is reduced to leave Millerton Lake storage at the minimum value. The reduction is distributed to the Friant-Kern Canal, Madera Canal, and San Joaquin controlled release based on their percentage of the total controlled release.

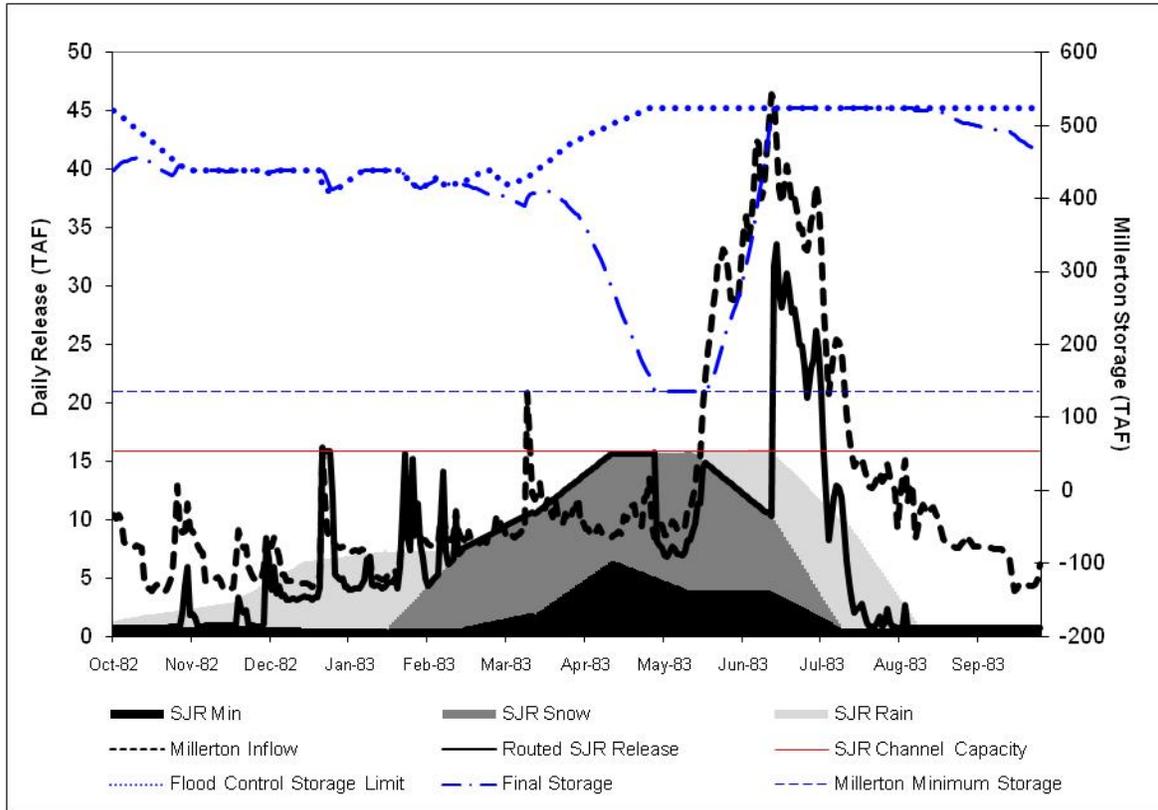
To simulate daily rain-flood operations, the spreadsheet tool calculates daily required flood storage space based on the reservoir operation curve, and any available credit space in the upstream Mammoth Pool. The daily required flood storage space in Millerton Lake is subtracted from the maximum Millerton Lake storage to obtain daily maximum storage. Rain-flood releases are made to prevent Millerton Lake storage from exceeding this daily maximum storage. The rain-flood release is then allocated to the following:

- Unused capacity in the Friant-Kern Canal (up to 1,200 cfs)
- Unused capacity in the Madera Canal (up to 100 cfs or 7.69 percent of the total rain-flood release in February through October, none in November through January)
- Available channel capacity in the San Joaquin River (up to 8,000 cfs total release to the river)
- Millerton Lake flood control storage encroachment, up to the maximum reservoir storage

### ***San Joaquin River Release***

Flood space is evacuated, at a maximum rate of 8,000 cfs, as soon as possible after reservoir inflows decrease. All releases to the San Joaquin River are made through the dam outlets, unless the reservoir is full and spilling. When this occurs, the spill is assumed to be released to the San Joaquin River over the spillway.

Figure 3-12 is an example of the results of the routing process for Millerton Lake operations and releases to the San Joaquin River. During the January-through-March period, the flood control storage limit fluctuates because of variable flood control storage in the upstream Mammoth Pool. During this period, final releases are above the interpolated releases, corresponding to short-term peaks in the inflow.



**Figure 3-12.**

**Millerton Lake Operations and San Joaquin River Release Routing Example**

In the January -to - March time period, the daily release to the San Joaquin River peaks at the 8,000 cfs channel capacity limit (15.84 TAF/day). The daily release during this period was at the San Joaquin River channel capacity limit of 8,000 cfs because sufficient storage was available in Millerton Lake to capture additional flood inflows. In late June through early July, the daily release to the San Joaquin River peaks at about 33.6 TAF/day (16,940 cfs), or more than double the San Joaquin River channel capacity. This is because Millerton Lake had filled to capacity and was unable to store additional inflows in excess of downstream channel capacity. During this time, the CalSim monthly release to the San Joaquin River was at channel capacity. This discrepancy is caused by the timing of when the reservoir fills and the duration of the flood control release on a daily basis versus a monthly basis.

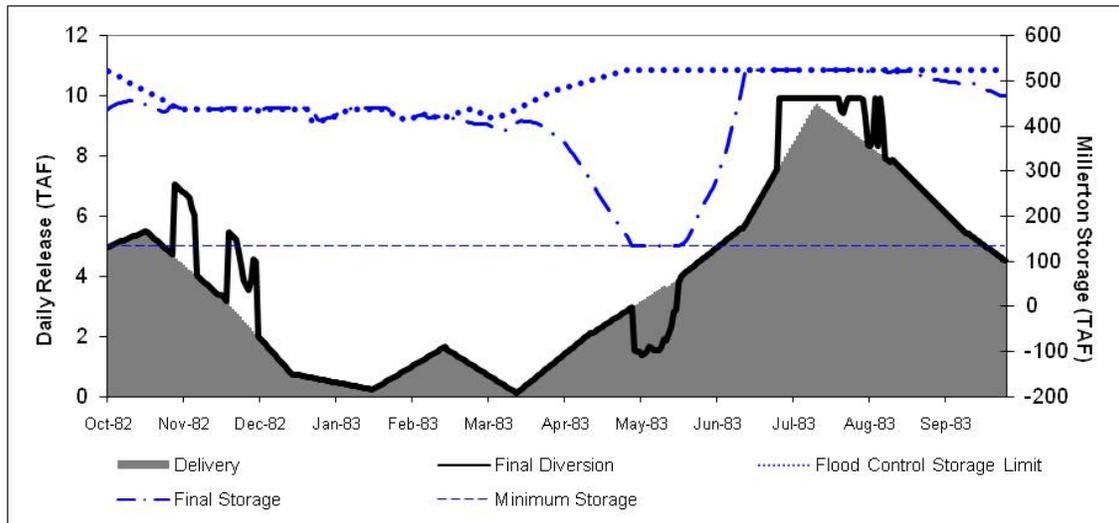
Actual storage drops from the flood control level in April to minimum storage in May, then increases to maximum storage by the end of June. This variability in Millerton Lake storage is due to the small storage capacity of Millerton Lake relative to inflow volume, which results in aggressive operations to maximize water supply.

In May, the routed San Joaquin River release drops below the linear interpolated release. This is because Millerton Lake storage had reached the minimum allowable, and releases were cut back to maintain the minimum pool.

***Friant-Kern Diversion Routing***

Figure 3-13 is an example of the results of the routing process for Millerton Lake operations and diversions to the Friant-Kern Canal.

The operation of the Friant-Kern Canal is very similar to the operation of Madera Canal, with flood control releases during early winter, and the same decrease in May when Millerton Lake is at minimum storage.



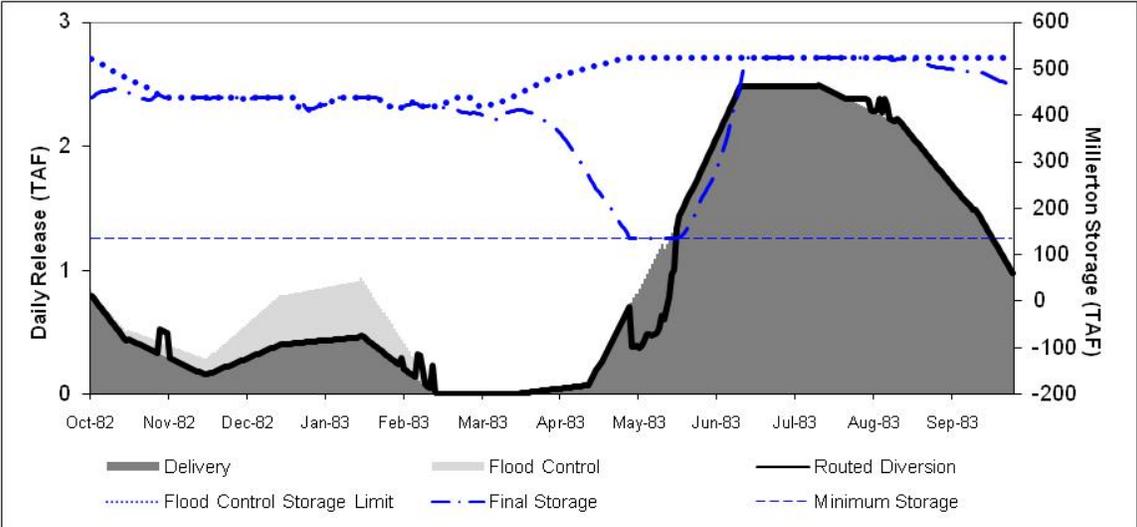
**Figure 3-13.**  
**Millerton Lake Operations and Friant-Kern Canal Diversion Routing Example**

***Madera Canal Diversion Routing***

Figure 3-14 is an example of the results of the routing process for Millerton Lake operations and diversions to the Madera Canal.

As can be seen in the figure, flood control releases to the Madera Canal in late October and the February-through-April period are similar to the timing of flood control releases to the San Joaquin River.

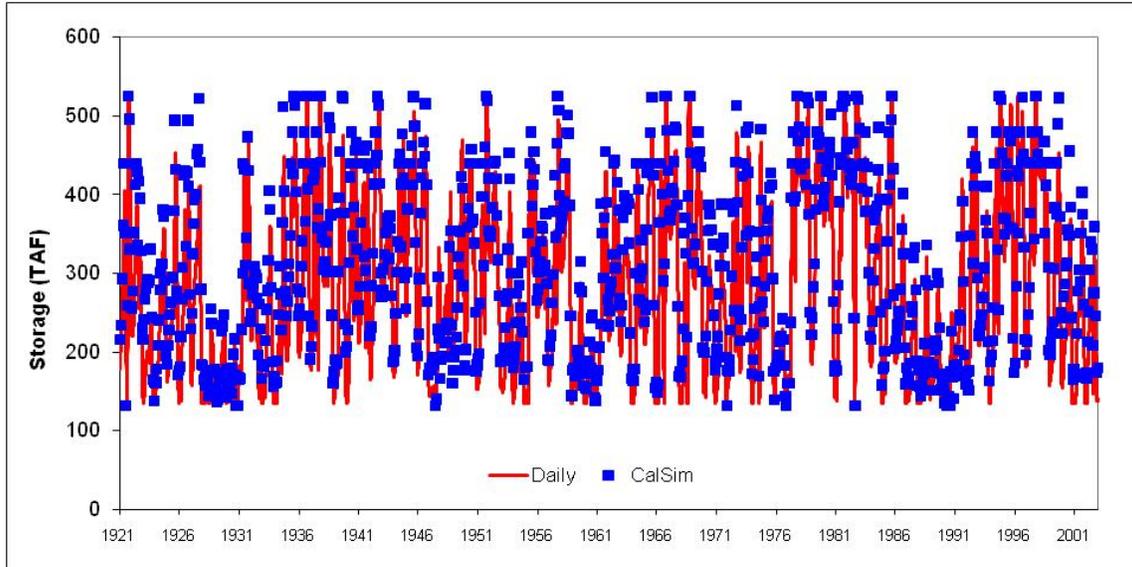
In May, the routed Madera Canal diversion drops below the linear interpolated diversion, which implies a cutback in delivery through the Madera Canal. This is because Millerton Reservoir reached minimum allowable storage, and diversions were cut back to maintain the minimum pool.



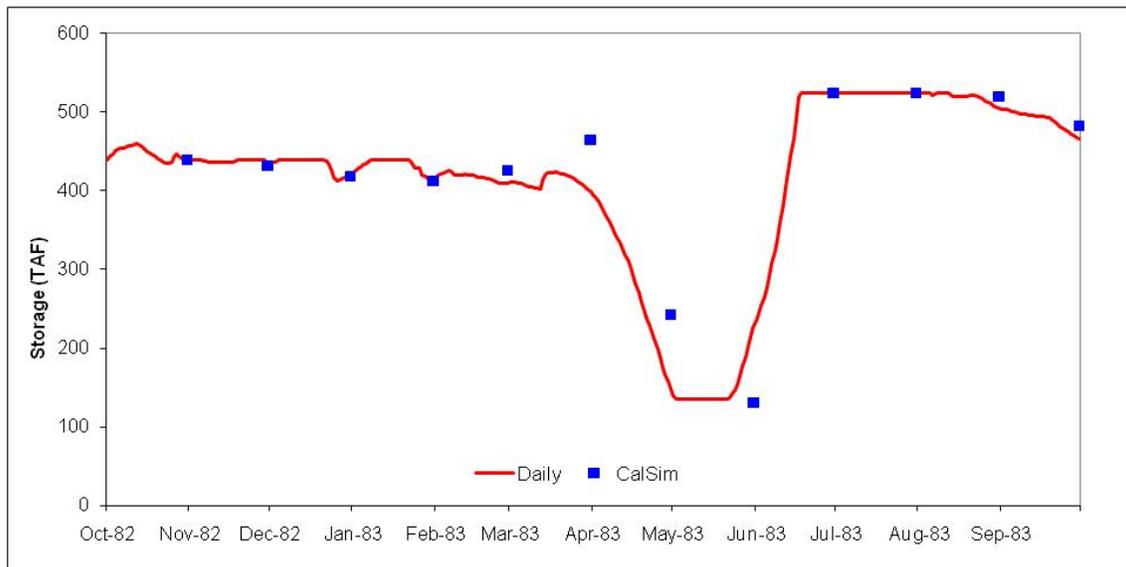
**Figure 3-14.**  
**Millerton Lake Operations and Madera Canal Diversions Routing Example**

**3.2.3 Consistency with CalSim Results**

Final daily water operations from the spreadsheet tool, while not expected to exactly match CalSim monthly results, are expected to be within the range of water operations from the CalSim simulation. The total monthly inflow from this tool and the CalSim simulation are the same because the CalSim inflows were computed by summing the USAN daily inflow values used in the example. This implies that if the storage operations are similar, the overall operations must be similar, and storage can be used to evaluate how well the daily operations from the spreadsheet tool fall within the range of water operations from CalSim. Figures 3-15 and 3-16 show the comparison of the CalSim monthly storage and simulated daily storage operations for the period of record, and for example year 1983, respectively.

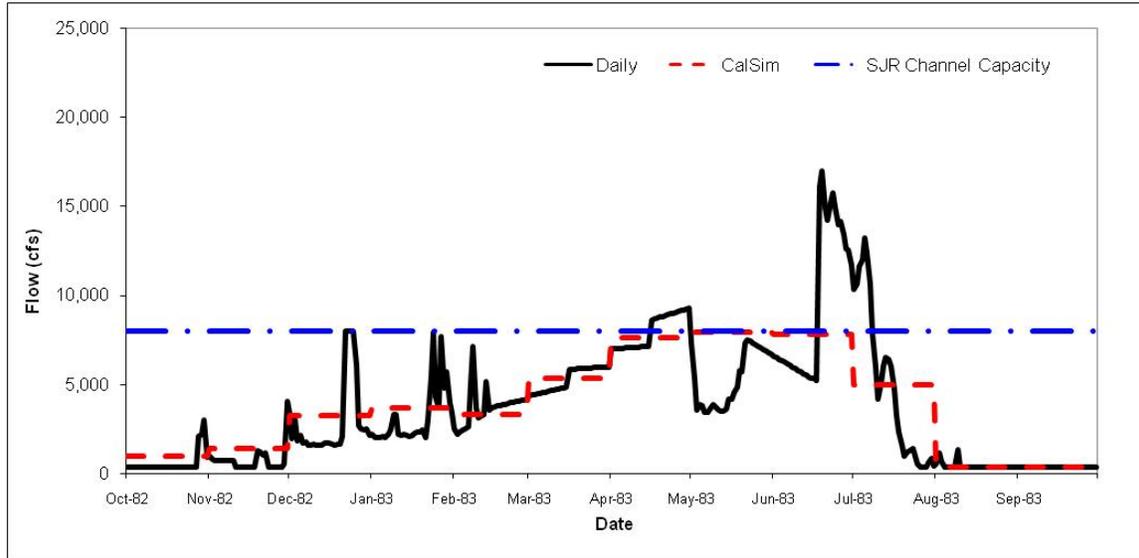


**Figure 3-15.**  
**Period of Record Comparison of Daily Spreadsheet Tool and CalSim Simulated Millerton Lake Storage**



**Figure 3-16.**  
**Example Year 1983 Comparison of Daily Spreadsheet Tool and CalSim Simulated Millerton Lake Storage**

Figure 3-17 is an example comparison of the daily spreadsheet tool releases compared to CalSim simulated San Joaquin River releases.



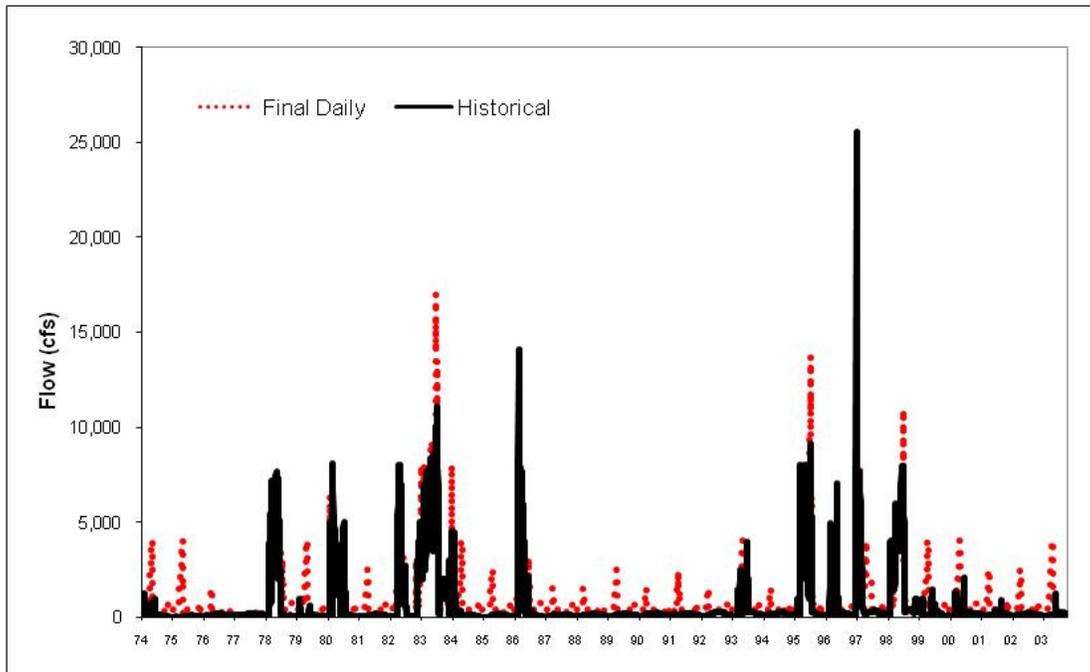
**Figure 3-17.**  
**Example Daily Spreadsheet Tool vs. CalSim San Joaquin River Release**

The general shape of the curves is similar, except from May through July. This discrepancy is likely due to differences between monthly and daily time steps of reservoir storage and simulated flows. Differences in reservoir storage and simulated flows cause different operational responses to monthly operational triggers.

### 3.2.4 Comparison with Historical Hydrology

As mentioned, the spreadsheet tool was used to develop daily flows from the USJRBSI baseline CalSim simulation. This CalSim simulation is a future level simulation using the Settlement hydrographs as minimum flows in the San Joaquin River.

These daily results were then compared to historical Millerton Lake releases from 1974 to 2004. The magnitude of the flows cannot be compared because the historical data reflect different operational assumptions than in the CalSim simulation, especially related to demands and minimum San Joaquin River flow requirements. The comparison evaluates whether general patterns in the disaggregated data appear reasonable for use. Figure 3-18 summarizes comparison results for 1974 through 2007.

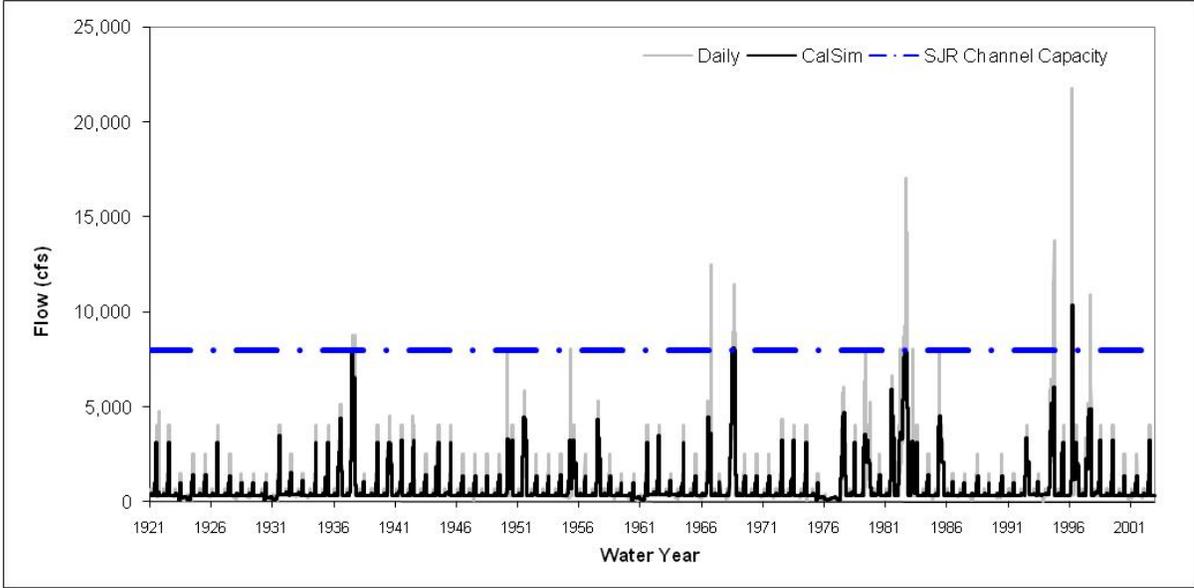


**Figure 3-18.**  
**Historical vs. Disaggregated San Joaquin River Flow**

As can be seen in the figure, the procedure resulted in a set of daily flows that follows well the general flow regime of the San Joaquin River. It is important to note that the disaggregation does not use historical inflows, diversions, or releases to the San Joaquin River, and flow magnitudes cannot be directly compared.

Increases in small flood peaks are due to the increase in the San Joaquin River minimum flow requirement from the Settlement flow schedule over historical values.

Figure 3-19 compares the results of the disaggregation process with the CalSim San Joaquin River releases. The figure shows that the overall patterns correspond well. The higher peak flows in daily results are due to the difference between using daily and mean monthly values. Averaging flows over a monthly time step in CalSim smoothes out the flow peaks.



**Figure 3-19.**  
**Disaggregated Flows vs. CalSim San Joaquin River Flows**

**3.2.5 Output Description**

The primary output from this model is daily Millerton Lake storage, diversions, and San Joaquin River release values for use in other models and analysis. Output ranges from October 1, 1921, to September 30, 2003.

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## 4.0 Water Quality Modeling

This section documents the modeling tools and modeling analysis performed to provide data on water quality in the study area for the EA/IS. Areas and water quality parameters modeled include the following:

- Millerton Lake – temperature
- San Joaquin River from Millerton Lake to the Merced River – temperature
- Lower San Joaquin River at Vernalis – salinity
- Delta – salinity

### 4.1 Millerton Lake Temperature Modeling

The WY 2010 Interim Flows would include increased minimum flow requirements in the San Joaquin River. These requirements would result in changes to Millerton Lake water operations, which may affect the temperature of water released to the San Joaquin River, and subsequent temperatures in downstream river reaches. The Millerton Lake temperature model provides a method to evaluate potential changes in Millerton release temperatures.

The Millerton Lake temperature model was originally developed for Reclamation during the *NRDC, et al., v. Kirk Rodgers, et al.*, litigation period, and has since been updated and modified to include the capability to model temperature control devices (TCD) on the Friant-Kern Canal and Madera Canal diversions as well as the San Joaquin River outlets.

#### 4.1.1 Model Description

The Millerton Lake temperature model is based on the W2 modeling platform. W2 is a two-dimensional (longitudinal and vertical) water quality and hydrodynamic model for rivers, estuaries, lakes, reservoirs, and river basin systems. W2 consists of directly coupled hydrodynamic and water quality transport models. Developed for reservoirs and narrow, stratified estuaries. W2's capabilities include longitudinal and vertical hydrodynamics and water quality in stratified and nonstratified systems; multiple algae, epiphyton/periphyton, zooplankton, macrophyte, carbonaceous biochemical oxygen demand (CBOD), and generic water quality groups; internal dynamic pipe/culvert modeling; hydraulic structure (weirs, spillways) algorithms, including submerged and two-way flow over submerged hydraulic structures; and a dynamic shading algorithm based on topographic and vegetative cover. For this application, only temperature is modeled. Several inputs are required for the model, as described below.

#### ***Meteorological Data***

Meteorological input data used in the Millerton Lake temperature model include air temperature, dew point, wind speed, wind direction, cloud cover, and solar radiation. The main source of data is historical observations recorded at the Fresno Airport weather

station, the nearest representative long-term weather station to the study area (approximately 15 miles southwest of Millerton Lake).

### ***Bathymetry***

Bathymetry data for the reservoir include light detection and ranging elevation data from a 2001 aerial survey of the study area for ground surface elevations above the Millerton Lake water level (about 500 feet) during the period of the aerial survey, and bathymetric data for Millerton Lake based on a recent sonar survey. The Millerton Lake bathymetric data used in the temperature model are consistent with updated data used in the Reclamation temperature model of Millerton Lake.

### ***Inflow Temperatures***

At Kerckhoff Lake, on the San Joaquin River upstream from Millerton Lake, much of the river's flow is diverted into a tunnel and through the Kerckhoff and Kerckhoff No. 2 powerhouses before the water returns to Millerton Lake. The remaining San Joaquin River flow continues down the river channel into Millerton Lake. The water flow in the San Joaquin River channel is subject to heating that the water flow in the tunnel bypasses. Therefore, the temperature of the San Joaquin River inflow is typically higher than the temperature of water from the powerhouses.

San Joaquin River temperature data below Kerckhoff Lake from Pacific Gas and Electric (PG&E) were used to develop San Joaquin River inflow temperature data. Temperature data at Kerckhoff Lake were used to develop powerhouse inflow temperature data. Missing data were estimated using an algorithm that attempts to match temperature data across similar years.

#### **4.1.2 Model Calibration**

Initial model calibration compared simulated results to measured temperature profiles 0.53 kilometers from the dam in 2004 and 2005. The model was later recalibrated using Reclamation-measured temperature profiles and release temperatures gathered from 2004 through 2006. The final calibration produced results with differences of less than 1 degree centigrade (°C) from the measured profile and release temperatures. An absolute mean error of less than 1°C is often used as a basis for determining an acceptable calibration (Cole and Wells 2006). Based on a review of the calibration methods and results, Reclamation approved the model for use in the USJRBSI.

#### **4.1.3 Modeling Approach and Assumptions**

The model was applied by varying the water operation boundary conditions as appropriate for the No-Action Alternative and Proposed Action. Other boundary conditions such as meteorology and inflow temperatures remained constant between alternatives.

### ***Period of Record***

The desired simulation period for WY 2010 Interim Flow use is from 1980 to 2003, with 1-day flow and 6-hour temperature time steps to allow analysis of diurnal temperature fluctuations. The actual period simulated in the model is 1977 to 2003 on a 1-hour time step. The initial 3 years (1977 - 1979) are a "warm-up period" to capture appropriate

antecedent conditions in the lake. The hourly outputs are averaged over the final desired flow and temperature time steps after model execution has been completed.

### ***Water Operations Data***

The Millerton Lake temperature model uses daily water operations data for San Joaquin River inflow, Friant-Kern Canal and Madera Canal diversions, and controlled release and spill to the San Joaquin River.

San Joaquin River inflows are from the USAN model. The USAN model is a daily operational model of the San Joaquin River system upstream from Millerton Lake. These daily flows are also used to define monthly Millerton Lake inflows for the CalSim water operations model. CalSim is used to define the overall Millerton Lake water operations boundaries.

Millerton Lake diversions to the Friant-Kern and Madera canals and releases to the San Joaquin River come from a daily disaggregation process applied to CalSim monthly TS data. This process is described in greater detail in Section 3.2.

## **4.2 San Joaquin River Temperature Modeling**

Temperatures in the San Joaquin River downstream from Millerton Lake are critical to the success of the SJRRP. The San Joaquin River Temperature Model (SJR5Q) provides a method to evaluate the temperatures in this reach of the river.

The SJRRP includes increased minimum flow requirements in the San Joaquin River. These requirements would result in changes to Millerton Lake water operations, which may affect the temperature of water released to the San Joaquin River, and subsequent temperatures in downstream river reaches. SJR5Q provides a method to evaluate the temperatures in the San Joaquin River downstream from Millerton Lake.

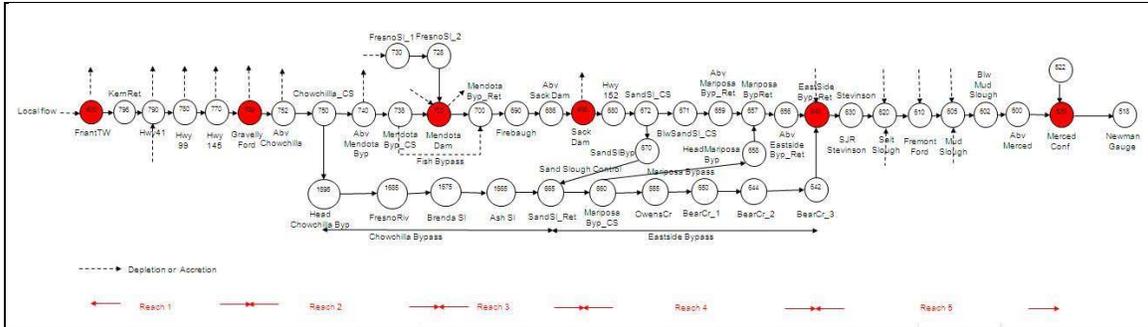
### **4.2.1 Model Description**

SJR5Q covers the San Joaquin River downstream from Millerton Lake to the confluence with the Merced River. The model was developed using the USACE HEC-5Q modeling tool, which can be used for simulating water flow and quality of reservoirs and streams. SJR5Q uses the river modeling capabilities of HEC-5Q to model both flow and temperature in the San Joaquin River. The HEC-5Q users manual (HEC 1986) has a more complete description of the water quality relationships included in the model.

### ***Model Representation of the Physical System***

SJR5Q represents the San Joaquin River as a network of discrete segments (reaches and/or layers, respectively) for application of HEC-5 for flow simulation, and HEC-5Q for temperature simulation. Within this network, control points (CP) are designated to represent selected stream locations where flow, elevations, and volumes are computed. In HEC-5, flows and other hydraulic information are computed at each CP. Figure 4-1 is a schematic of the HEC-5 representation of the San Joaquin River from Millerton Lake to the confluence with the Merced River.

## San Joaquin River Restoration Program



**Figure 4-1.**  
**SJR5Q Model Schematic**

### ***Model Representation of Streams***

River or stream reaches are represented conceptually as a linear network of segments or volume elements. The length, width, cross-sectional area, and a flow-versus-depth relationship characterize each element. A cubic polynomial curve fit of all input data provides a continuous relationship between flow and the hydraulic parameter defining each cross section. Cross sections are defined at all CPs and at intermediate locations where data are available. Element lengths typically range from a few hundred feet to several thousand feet.

The flow-versus-depth relation is developed external to SJR5Q using available cross section data and appropriate hydraulic computations. For the San Joaquin River and bypasses, the USACE Comprehensive Study data set was used (USACE 2002). This detailed data set incorporates all control structures, bridge restrictions, and critical sections that control or restrict flow.

### ***Stream Accretions and Depletions***

HEC-5Q requires that flow rates and water quality be defined for all inflows. Available data were evaluated and processed to define all hydrologic inputs for an evaluation period of 1980 through 2003. The following flow assumptions are used in SJR5Q:

- **San Joaquin River above the Mendota Pool** – Partial flow records for tributary stream (Cottonwood and Little Dry Creek) and river gage locations (Friant Dam, Donny Bridge, Skaggs Bridge, and Gravelly Ford) were evaluated to develop estimates of time-dependent inflows and seasonal depletions above Gravelly Ford. Total depletions were distributed within the model based on gage data tendencies. Diversions to the Chowchilla Bypass were computed within the model as a function of river flow.
- **Mendota Pool to Sack Dam** – Seasonal diversions from Mendota Pool and at Sack Dam (Arroyo Canal) were developed from available flow records (e.g., San Joaquin River at Mendota 1999 – 2006, U.S. Geological Survey (USGS)). These demand assumptions, plus observed James Bypass (USGS) flows and computed San Joaquin River inflow were used to compute the required DMC flows by mass

balance. The mass balance computation assumed a January 1 through February 15 maintenance drawdown of the Mendota Pool.

- **San Joaquin River below Sack Dam** – Observed data at Stevinson (USGS), partial Bear Creek flow data, and computed flow to the Eastside Bypass and below Sack Dam were used to compute net accretions/depletions considering flow attenuation consistent with routing coefficients used in the model.
- **San Joaquin River between Stevinson and the Merced River** – Flow records for the San Joaquin River at Stevinson and Newman, Mud and Salt sloughs, and the Merced River at Stevinson were used to compute net accretions and depletions for this section of the river. Flows from the two sloughs and other accretions dominate temperatures in this area during low San Joaquin River flows, and are an important influence on temperature at moderate river flows.

### ***Temperature Boundary Conditions***

There is very limited availability of temperature data on accretions in this reach of the San Joaquin River. Historic temperature data were used to the maximum extent possible to develop relationships that fill in data gaps.

### ***Meteorological Data***

Hourly air temperature, wind speed, relative humidity, and cloud cover for each day were used to compute the average equilibrium temperature, surface heat exchange rate, solar radiation flux, and wind speed at 6-hour intervals for input to the SJRQ5.

For temperature simulation using HEC-5Q, specification of water surface heat exchange data requires meteorological zones to be designated within the study area. Each CP within the system or subsystem used in temperature or water quality simulation must be associated with a defined meteorological zone.

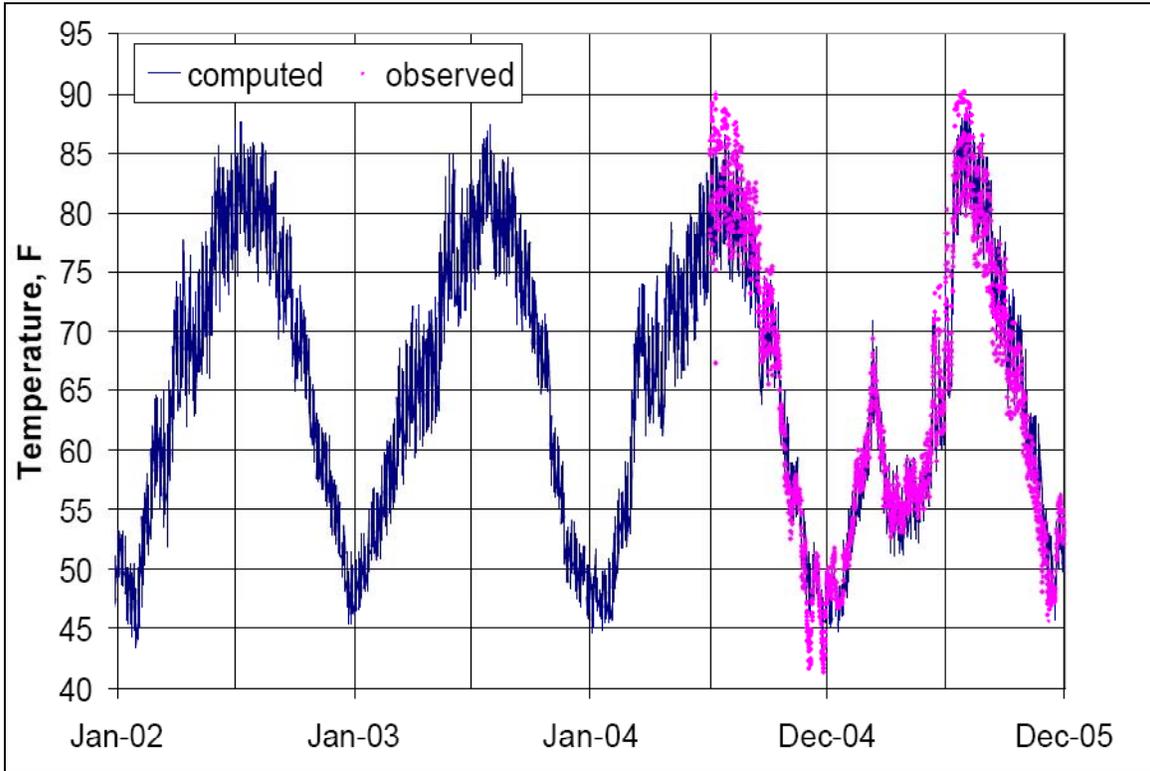
Six meteorological zones were developed for SJR5Q. Heat exchange coefficients for each zone were computed to reflect typical environmental conditions. For sheltered stream sections, wind speed was reduced and shading was assumed to reflect riparian canopy conditions. Reduced wind speed decreases evaporative heat loss and results in higher equilibrium temperatures and lower heat exchange rates, and vice versa for increased wind speed. Shading reduces solar radiation, resulting in lower equilibrium temperatures and lower heat exchange rates.

The meteorological data collected as part of the SJRRP were used in determining the heat exchange adjustments to individual stream sections. Information pertaining to the meteorological zones and their descriptions can be found in a 2007 report (RMA).

### ***Model Calibration***

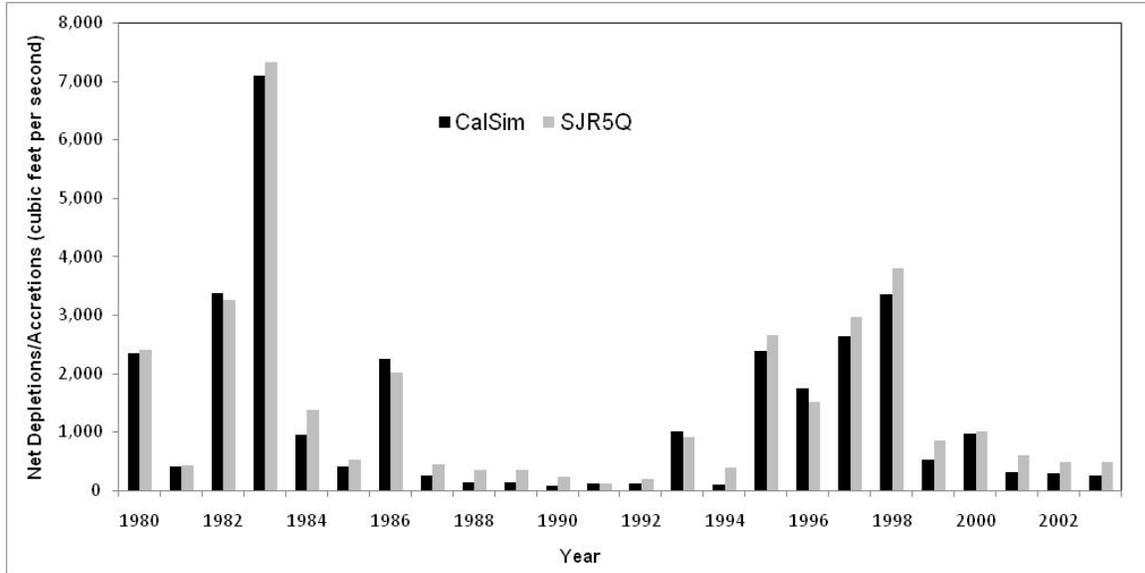
SJR5Q was calibrated for the period between 2000 and 2005 at nearly 15 different locations in the San Joaquin River downstream from Friant Dam. Calibration of the SJR5Q was performed by graphically and statistically comparing computed and observed river temperature TS. Different statistical measures such as Mean Error (bias), Mean Absolute Error, and Root Mean Squared Error were used to evaluate calibration results.

Figure 4-2 shows a graphical comparison between simulated temperature and observed temperature at Gravelly Ford. Simulated results are in good agreement with the observed values except during the summer. The difference can be attributed to a several cfs minimum flow assumption when there is no observed flow at this location (RMA 2007). A detailed documentation of the calibration methodology and results comparing simulated and observed temperatures at various locations in the San Joaquin River can be found in RMA (2007).



**Figure 4-2.**  
**Computed and Observed Temperatures at Gravelly Ford**

Flows simulated by SJR5Q are heavily dependent on assumed accretions and depletions along the San Joaquin River. Figure 4-3 compares total accretions/depletions between SJR5Q and CalSim along the San Joaquin River from Millerton Lake to the Merced River. Because of the lack of resolution in CalSim, it was not possible to perform an acceptable comparison of the accretions/depletions between the values computed for SJR5Q and CalSim on a reach-by-reach basis.



**Figure 4-3.**

**Comparison of Net San Joaquin River Accretions/Depletions in CalSim and SJR5Q**

#### 4.2.2 Modeling Approach and Assumptions

The model was applied by varying the water operation boundary conditions, as appropriate, for the No-Action Alternative and Proposed Action. Other boundary conditions such as meteorology, and accretions/depletions remain constant between alternatives.

##### ***Period of Record***

The desired simulation period is from 1980 to 2003, with 1-day flow and 6-hour temperature time steps to allow analysis of diurnal temperature fluctuations. This is the simulation period for SJR5Q.

##### ***Millerton Lake Release Temperature***

The Millerton Lake release temperature at a 6-hour time step for the entire simulation period is obtained from the Millerton Lake temperature model and used as input to SJR5Q. The temperature is a weighted average of the Millerton Lake spill, if any, and outlet release temperatures.

##### ***Flow Routing***

There are three major controlled diversions in the San Joaquin River between Friant Dam and the Merced River: the San Joaquin River diversion to the Chowchilla Bypass, the San Joaquin River diversion at Sand Slough to the Eastside Bypass, and the Eastside Bypass Diversion to the Mariposa Bypass.

Operational rules for flow routing were primarily modeled using routing procedures in the HEC model. However, certain rules are complicated at some decision points, and flow routing could not be easily performed in SJR5Q.

**Chowchilla Bypass Diversion.** The governing rules for the Chowchilla Bifurcation Structure operations are as follows:

- Leave the first 1,500 cfs in the San Joaquin River
- Divert the next 5,500 cfs into the Chowchilla Bypass
- Leave the next 1,000 cfs in the San Joaquin River for a total of 2,500 cfs
- If the inflow to the Mendota Pool from the James Bypass is greater than 2,000 cfs, increase the diversion to the Chowchilla Bypass to maintain a flow of 4,500 cfs below the Mendota Pool
- At higher San Joaquin River and/or Fresno Slough flows, perform operations to minimize flood damages in the local area

In reality, the rules were implemented differently, as described in a 2002 report (Mussetter Engineering, Inc.). The report describes a fairly complicated, multiple-step procedure used to develop the diversion to the Chowchilla Bypass in an attempt to prevent flood damage in the San Joaquin River, in both Reach 2B and Reach 3, by diverting as much water as possible down the bypass and then splitting any remaining Reach 3 flooding evenly between the bypass and the San Joaquin River.

Operations rules for all simulations are as follows:

- Divert the first 1,500 cfs to Reach 2B
- Divert the next 5,500 cfs to Chowchilla Bypass
- Divert the next 1,000 cfs to Reach 2B
- Additional flow is split 50/50 between the Chowchilla Bypass and Reach 2B
- If Reach 3 flow below Mendota Dam is greater than 1,300 cfs, make additional diversion to the bypass up to the minimum of the following after first filling unused bypass capacity:
  - Reach 3 flooding (flow over 1,300 cfs)
  - Unused bypass capacity
  - Reach 2B flow (remaining flow after initial diversion)
- If Reach 3 flow is still greater than 1,300 cfs, then make additional diversion to bypass up to the minimum of the following (split unavoidable flooding 50/50 between bypass and river):
  - Fifty percent of remaining Reach 3 flooding (remaining flow over 1,300 cfs)
  - Remaining Reach 2B flow

This rule is too complicated for the HEC-5 flow modeling capability to easily implement. For EA/IS modeling, flow routing was performed by running SJR5Q and allowing it to determine the diversion to the Chowchilla Bypass using the first four rules above, meaning without trying to increase the diversion to the Chowchilla Bypass to protect Reach 3. An Excel spreadsheet was then used to extract flows from the SJR5Q output,

and to compute a new diversion each day, implementing the final two rules above. This new diversion is then input to a second run of the SJR5Q model as a fixed diversion to the Chowchilla Bypass.

**Sand Slough Control Structure (top of Reach 4B).** The Sand Slough Control Structure operation rules limit downstream San Joaquin River flows to the 1,500 cfs flood control limit. The present capacity of the San Joaquin River channel is zero in some locations, and in actual operation, the entire San Joaquin River flow is diverted through the Sand Slough Control Structure into the Eastside Bypass. The control structure has not been operated to allow water to flow into the San Joaquin River for many years.

Operations for all simulations are to divert the entire San Joaquin River flow to the Eastside Bypass.

**Mariposa Bypass Control Structure.** Operations rules call for flows of up to 8,500 cfs to be diverted into the Mariposa Bypass from the Eastside Bypass and back to the San Joaquin River. Recent operations however, allow 2,000 to 3,000 cfs to remain in the Eastside Bypass with 25 to 33 percent of any additional Eastside Bypass flow diverted into the Mariposa Bypass.

The Settlement does not make any provisions for modifications to this Bypass. The operation rule for all simulations is as follows:

- First 2,500 cfs remain in the Eastside Bypass
- Thirty percent of additional Eastside Bypass flow is diverted to the Mariposa Bypass and back to the San Joaquin River.

### 4.2.3 Output Description

San Joaquin River temperature modeling was performed on a 6-hour time interval from 1980 to 2003. Output data for the No-Action and Proposed Action simulations are included in the Temperature Modeling Output – SJR5Q Attachment.

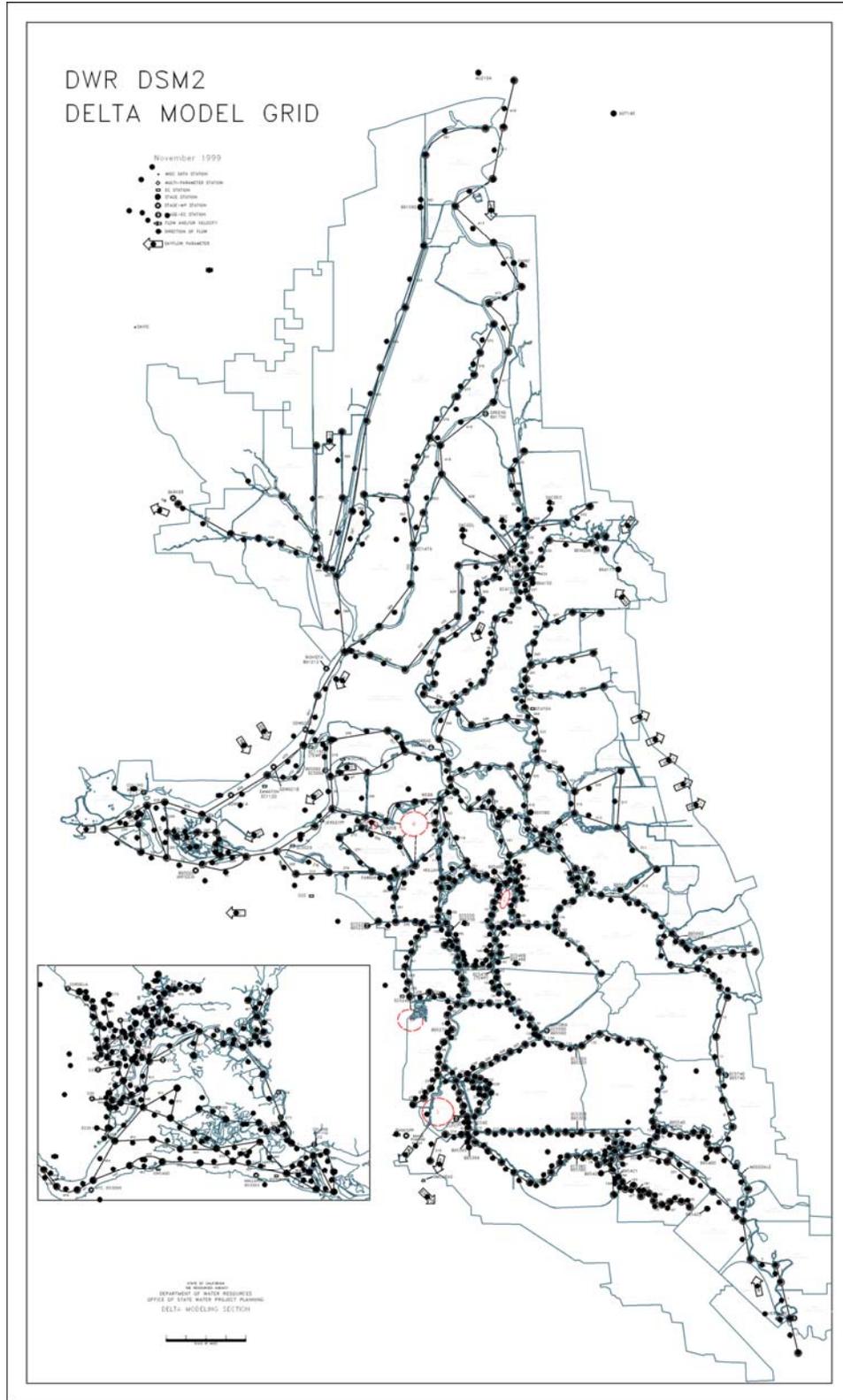
The main resource area concerned with water temperature in the San Joaquin River is fisheries. The Exhibit B SJRRP release schedules were designed with required flows in specific time periods of the year based on the Chinook salmon life stage expected during that period. Since different life stages require different temperatures, the mean temperature during the period is of importance in using the data in the fisheries analysis.

### **4.3 Delta Water Quality (DSM2)**

The DWR DSM2 is a branched one-dimensional, physically based numerical model of the Delta developed by DWR in the late 1990s. DSM2-Hydro, the hydrodynamics module, is derived from the USGS Four Point model. DSM2-Qual, the water quality module, is derived from the USGS Branched Lagrangian Transport Model. Details of the model, including source codes and model performance, are available from the DWR Bay-Delta Office, Modeling Support Branch Web site (DWR, 2009). Documentation of model development is discussed in annual reports to SWRCB (DWR 2009).

A DSM2 schematic is shown in Figure 4-4. Key DSM2 inputs include tidal stage, boundary inflow and salinity concentration, and operation of flow-control structures. Table 4-1 summarizes basic input requirements and assumptions.

In DSM2 model simulations, EC is typically used as a surrogate for salinity. Results from CalSim are used to define Delta boundary inflows. CalSim-derived boundary inflows include Sacramento River flow at Hood, San Joaquin River flow at Vernalis, inflow from the Yolo Bypass, and inflow from eastside streams. Net Delta outflow from CalSim is used to calculate the DSM2 salinity boundary at Martinez.



Source: DWR, 2009.

**Figure 4-4.  
DSM2 Schematic**

**Table 4-1.  
DSM2 Input Requirements and Assumptions**

<b>Parameters</b>	<b>Assumptions</b>
Period of simulation	October 1922 – September 2003
Boundary flows	CalSim output
Boundary stage	15-minute adjusted astronomical tide
Agricultural diversion and return flows	Delta Island Consumptive Use model, 2005/2020 LOD
<b>Salinity</b>	
Martinez EC	Computed from modified G-model, adjusted astronomical tide, and Net Delta Outflow from CalSim
Sacramento River	Constant value = 175 $\mu$ S/cm
Yolo Bypass	Constant value = 175 $\mu$ S/cm
Mokelumne River	Constant value = 150 $\mu$ S/cm
Cosumnes River	Constant value = 150 $\mu$ S/cm
Calaveras River	Constant value = 150 $\mu$ S/cm
San Joaquin River	CalSim EC estimate using modified Kratzer equation
Agricultural drainage	Varying monthly values that are constant year to year
<b>Facility operations</b>	
Delta Cross Channel	CalSim output
South Delta barriers	Temporary barriers/SDIP operation of permanent barriers

Key:

$\mu$ S/cm = microSiemens per centimeter

DSM2 = Delta Simulation Model 2

EC = electrical conductivity

LOD = level of development

SDIP = South Delta Improvements Program

### 4.3.1 Planning Tide at Martinez Boundary

Tidal forcing is imposed at the downstream boundary at Martinez as a TS of stage (for the hydrodynamic module) and salinity (for the water quality module). DWR has traditionally used a “19-year mean tide” (or “repeating tide”) in all DSM2 planning studies, in which the tide is represented by a single repeating 25-hour cycle.

An “adjusted astronomical tide” was later developed by DWR that accounts for the spring-neap variation of the lunar tide cycle for a 16-year period, from 1976 to 1991. (DWR 2001a). As part of the CACMP effort, an updated version of DSM2 was developed that simulates an 82-year (1922 through 2003) CalSim period of record using an adjusted astronomical tide.

### 4.3.2 Salinity Boundary Conditions

Salinity concentration is a key input to DSM2. The following salinity boundary conditions were used in EA/IS modeling efforts.

#### ***Martinez***

Salinity at the Martinez downstream boundary reflects intrusion of saltwater into San Pablo Bay from the ocean. It is determined using an empirical model known as the modified G-model (DWR 2001b). The model calculates a 15-minute TS of salinity values based on the adjusted astronomical tide and net Delta outflow. Since these aggregate

flows are available from CalSim, salinity at Martinez can be preprocessed and input to DSM2 as TS data. Each simulation has a different EC boundary condition at Martinez, reflecting the different inflows and exports from the Delta that occur in a particular scenario.

#### ***Sacramento River/Yolo Bypass/ Eastside Streams***

The inflow salinities for the Sacramento River, Yolo Bypass, and eastside streams (Mokelumne, Cosumnes, and Calaveras rivers) were assumed to be constant at 175, 175, and 150 microSiemens per centimeter ( $\mu\text{S}/\text{cm}$ ), respectively.

#### ***San Joaquin River at Vernalis***

CalSim calculates EC for the San Joaquin River at Vernalis using a modified Kratzer equation. The resulting EC values were used to define the inflow salinity for DSM2. Each simulation has a different EC boundary condition at Vernalis, reflecting different upstream operations on the San Joaquin River and its tributaries.

#### ***Agricultural and Municipal and Industrial Return Flows***

The salinity of agricultural return flows was based on an analysis of Municipal Water Quality Investigations (MWQI) data (DWR 1995). Monthly, regional representative EC values of drainage were determined for three regions in the Delta (north, west, and southeast regions). EC values vary by month, but are constant from year to year and are independent of the LOD. EC values were highest for the west region because of its proximity to the ocean. Monthly EC values follow a seasonal trend, with the highest concentrations occurring in winter and spring during the rainfall-runoff season (approximately 820  $\mu\text{S}/\text{cm}$  to 1,890  $\mu\text{S}/\text{cm}$ ). Lowest drainage concentrations occur in July and August (approximately 340  $\mu\text{S}/\text{cm}$  to 920  $\mu\text{S}/\text{cm}$ ).

### **4.3.3 Delta Channel Flow**

Sacramento River water flows into the central Delta via the Delta Cross Channel and Georgiana Slough. The Delta Cross Channel, constructed in 1951 as part of the CVP, connects the Sacramento River to the Mokelumne River via Snodgrass Slough. Its purpose is to increase flow in the lower San Joaquin River and to reduce salinity intrusion and the movement of saline water from Suisun Bay toward Contra Costa Water District's (CCWD) Rock Slough Intake and the C.W. "Bill" Jones Pumping Plant (Jones Pumping Plant). Two radial gates regulate flow through the Delta Cross Channel. When the gates are open, flow through the Delta Cross Channel is determined by the upstream stage in the Sacramento River. Similarly, flow through Georgiana Slough is a function of the upstream Sacramento River stage. Sacramento River water is also transported southward through Threemile Slough, which connects the Sacramento River, just downstream from Rio Vista, to the San Joaquin River.

The mouth of the Old River, located upstream from the mouth of the Mokelumne River, is the major conduit for water flowing from the Sacramento River, through Georgiana Slough and the Delta Cross Channel, via the Mokelumne River, to the south Delta. Additional water for CVP/SWP export pumps moves through the mouth of the Middle River, Columbia Cut, Turner Cut, False River, Fisherman's Cut, and Dutch Slough. Net flows at the mouth of the Old River and Middle River are influenced by CVP/SWP

exports and south Delta irrigation diversions (approximately 40 percent of total net Delta diversions). Previous DSM2 simulations indicate that about 45 percent of south Delta exports flows through the mouth of the Old River or through the False River. About 40 percent of the south Delta exports flows through the mouth of the Middle River, and about 10 percent of the flow is through Turner Cut. This division of flow is insensitive to the magnitude of exports (Jones and Stokes 2004).

#### **4.3.4 Control Structures**

A number of flow-control structures are currently operated seasonally in the Delta. These structures can affect water quality by changing the pattern of flow through the Delta.

##### ***Clifton Court Forebay***

In all DSM2 simulations, the Clifton Court Forebay gates were operated tidally using “Priority 3.” Under Priority 3, the gates are closed 1 hour before and 2 hours after the lower low tide. They are also closed from 2 hours after the high low tide to 1 hour before the high tide. Discharge is proportional to the square root of the head difference across the gates. Maximum flow was capped at 15,000 cfs. The discharge coefficient was set equal to 2,400, which results in a flow of 15,000 cfs for a 1.0-foot head difference.

##### ***Delta Cross Channel***

The Delta Cross Channel affects salinity in the central and south Delta. CalSim calculates the number of days the Delta Cross Channel is open in each month. The 1995 WQCP (SWRCB 1995) specifies that the gates be closed for 10 days in November, 15 days in December, and 20 days in January, from February 1 to May 20, and for 14 days between May 21 and June 15. In addition, the gates must be closed to avoid scouring whenever Sacramento River flow at the Delta Cross Channel is greater than 25,000 cfs. For DSM2 simulations, all partial-month closings of the Delta Cross Channel were assumed to occur at the end of the month.

##### ***South Delta Barriers***

DSM2 modeling of existing conditions includes the South Delta Temporary Barriers Project, which consists of four rock barriers that are temporarily installed across south Delta channels. The objectives of the project are as follows:

- Increase water levels, circulation patterns, and water quality in the south Delta area for local agricultural diversions
- Improve operational flexibility of the SWP to help reduce fishery impacts and improve fishery conditions

Details of the temporary barriers can be found on DWR’s Website (2009). Of the four temporary barriers, the Head of Old River barrier serves as a fish barrier and has been in place most years, between September 15 and November 30, since 1963. The remaining three barriers serve as agricultural barriers and are installed between April 15 and September 30. Installation and removal dates of the barriers are based on the USACE Section 404 Permit, California Department of Fish and Game 1601 Permit, and various Temporary Entry Permits required from landowners and local Reclamation Districts.

Table 4-2 gives the assumed temporary barrier operations for modeling existing conditions.

**Table 4-2.  
Temporary Barrier Simulated Operation**

<b>Barriers</b>	<b>DSM2 Channel No.</b>	<b>Closure</b>	<b>Complete Removal</b>
Head of Old River (spring)	54	April 15	May 15
Head of Old River (fall)	54	September 15	November 30
Middle River	134	April 15	November 30
Old River near Tracy	99	April 15	November 30
Grant Line Canal	206	May 15	November 30

Source: Reclamation and DWR 2005.

Key:

DSM2 = Delta Simulation Model 2

**Suisun Marsh Salinity Control Gate**

The Suisun Marsh Salinity Control Gate limits flow in Montezuma Slough from Suisun Marsh during flood tide, and allows drainage from the marsh during ebb tide. The gates are not operated in the summer months (June through September) and are not operated at all in some wet years. Actual gate operations are triggered by salinity levels in Suisun Marsh. However, in DSM2 months, gate operations are an input to the model. Suisun Marsh Diversion and drainage flows have relatively little effect on salinity upstream from Chipps Island.

**4.3.5 Delta Island Consumptive Use**

DSM2 uses the Delta Island Consumptive Use (DICU) model to develop agricultural diversions and return flows to each of 142 Delta subareas on a monthly time step. An associated routine allocates the diversions and return flows to approximately 250 diversion nodes and 200 drainage nodes in DSM2. The DICU model considers precipitation, seepage, evapotranspiration, irrigation, soil moisture, leach water, runoff, crop type, and acreage. Net DICU is computed as diversions plus seepage, less drainage. Positive values indicate a net depletion of water from Delta channels; negative values indicate a net return flow from the Delta islands into the channels. DICU follows the seasonal pattern of irrigation diversions during summer, and drainage return flows from winter runoff.

DSM2 net channel accretions and depletions match aggregated values used in CalSim so that net Delta outflow is consistent between the two models.

**4.3.6 Water Quality Conversions**

DSM2 uses EC as a substitute for salinity. However, other water quality constituents were needed to assess potential impacts of the Proposed Action.

DWR derived relationships among EC, bromide, and chloride at Delta export locations for use in the In-Delta Storage Investigations (Suits 2001). Suits (2001) gives a regression equation for EC at the Old River at Rock Slough as a function of chloride at Contra Costa

Canal Pumping Plant No. 1, and a regression equation relating EC to chloride at the Los Vaqueros Intake. The relationship between EC and chloride in the vicinity of the Clifton Court Forebay and DMC Intake is more complex. In general, the relationship depends on whether source water is derived from the San Joaquin River or Sacramento River. The regression equation established by Suits is conservative, giving high values of chloride for a given EC (2001). The relationship between chloride and bromide is fairly uniform, with little

site-specific variation (Suits 2001). Therefore, a single regression equation can be used for different export locations. Regression equations used to convert EC to chloride are given in Table 4-3.

**Table 4-3.  
Relationship Between Salinity Parameters**

<b>Location</b>	<b>Slope</b>	<b>Intercept</b>
CCWD Pumping Plant No.1	0.268	-24.0
Clifton Court Forebay	0.273	-43.9
DMC Intake	0.273	-43.9

*Source: Suits 2001*

Key:

CCWD = Contra Costa Water District

DMC = Delta-Mendota Canal

### 4.3.7 Monthly Modeling Results

Simulated monthly averages of daily DSM2 modeling results at representative locations are presented in the Delta Simulation Modeling Output – DSM2 Attachment. Table 4-4 lists the information included for each scenario.

**Table 4-4.  
DSM2 Results Presented in  
Delta Simulation Modeling Output – DSM2 Attachment**

Location	Parameter
Sacramento River at Collinsville	EC
Sacramento River at Chipps Island	EC
Sacramento River at Emmanton	EC
Sacramento River at Jersey Point	EC
Sacramento River at Brandt Bridge	EC
Sacramento River at Vernalis	EC
Old River near Tracy Road Bridge	EC
Old River at Middle River	EC
Old River at Hwy 4 (CCWD Intake)	EC
Old River at Bacon Island	EC
Delta - Mendota Canal at Tracy Pumping Plant	EC
Contra Costa Canal Pumping Plant No. 1	EC
West Canal at mouth of CC Forebay Intake	EC
Middle River at Victoria Canal	EC
Middle Mendota Canal at Tracy Pumping Plant	Cl
Delta - Mendota Canal at Tracy Pumping Plant No. 1	Cl
West Canal at mouth of CC Forebay Intake	Cl
Middle River near Howard Road	Stage
Old Bridge near Tracy Road Bridge	Stage
Doughty Cut above Grant Line Canal Barrier	Stage
East of Coney Island	Stage
Sacramento River at Collinsville	EC

Key:

CC = Clifton Court

CCWD = Contra Costa Water District

Cl = chloride

DSM2 = Delta Simulation Model 2

EC = electrical conductivity

Hwy = highway

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## **5.0 Regional Groundwater Modeling**

This section describes the groundwater analytical tool used to evaluate changes to regional groundwater conditions, approach and assumptions, and output data related to the Proposed Action presented in the WY 2010 Interim Flows EA/IS. Assessments of regional groundwater levels will be made for the entire delivery area for the Friant - Kern Canal, Madera Canal, and areas adjacent to the Friant - Kern and Madera canal service areas.

The Water Management Work Group requires groundwater analytical tools to evaluate changes to groundwater resources from implementing the SJRRP. The regional groundwater analysis addresses this need by evaluating potential effects to groundwater resources as a result of the Proposed Action, as identified in the WY 2010 Interim Flows EA/IS. WY 2010 Interim Flows would result in changes to flows in the San Joaquin River below Friant Dam, and changes in surface water deliveries to water users within the Friant Division. These changed conditions would in turn result in changes in groundwater-surface water interaction and changes in groundwater pumping. Groundwater conditions, including groundwater levels and groundwater quality, would respond to these changes. This section documents the groundwater analytical tool used to evaluate the response of groundwater levels to changes in groundwater pumping, as reported in the WY 2010 Interim Flows EA/IS.

### **5.1 Model Description**

Groundwater analytical tools often have the ability to simulate groundwater conditions for a regional area, such as a water agency service area, a county or multicounty area, or entire groundwater basin. For the purposes of assessing of regional groundwater conditions within the Restoration Area, a review process was completed to identify analytical tools that could be used to evaluate regional groundwater conditions. A number of spatially distributed numerical models were identified as being under development or modified, but none were available to meet the schedule requirements associated with completing the WY 2010 Interim Flows EA/IS. Models removed from immediate consideration, but that may be reconsidered at a later date if available, when deemed suitable and practical, include the Central Valley Hydrologic Model (Faunt et al. 2008), C2VSIM (DWR 2007a and 2007b), and HydroGeoSphere (DeMarco and Matanga 2007).

During litigation, studies were completed by experts to better understand potential implications of the Settlement on regional groundwater and seepage issues. Data and reports collected during this period are available for most of the Friant Division, but are not readily available for evaluating potential effects of the WY 2010 Interim Flows on non-Friant regions. Therefore, more information (data, analytical tools, and published reports) is generally available for the Friant Division than non-Friant regions.

The following section discusses the analytical pathway for describing regional groundwater responses. Friant Division methods rely on testimony delivered during Settlement litigation, which is dependent on historical groundwater levels and Irrigation Training and Research Center estimated pumping for the Friant Division (Schmidt 2005a, Schmidt 2005b, Burt 2005).

A simplified numerical tool developed by Schmidt (2005b) during litigation was used to evaluate changes in groundwater conditions in the Friant Division as part of the regional groundwater analysis. This regional groundwater tool estimates the depth to groundwater within Friant Division contractor areas according to relationships describing annual groundwater pumping and resulting depth to groundwater developed by Dr. Schmidt (2005b). The report completed by Schmidt in 2005 presents the best available data describing the relationship between groundwater pumping and groundwater depth within the Friant Division. Relationships between groundwater pumping and groundwater depth within the Friant Division, as developed by Dr. Schmidt, are linear and describe annual aquifer drawdown. To estimate long-term aquifer drawdown for future conditions, annual drawdown within each district region was applied for a 25-year period to correspond to 2030 conditions. Key assumptions associated with using these relationships are described below.

Regional groundwater analysis involved development of a spreadsheet model that uses the Schmidt (2005b) relationships together with simulated surface water deliveries from CalSim. For the Proposed Action evaluation, surface water delivery output data from CalSim were proportionally disaggregated from seven WMAs to contractor-level deliveries based on existing Class 1 and Class 2 water contract entitlements. In addition to the Class 1 and Class 2 deliveries, contractors received additional 215 water and 16(b) water under the Proposed Action, which was distributed proportionally to the reduced Class 1 and Class 2 deliveries to each contractor. Contractor-level surface water deliveries were used to estimate groundwater pumping, assuming pumping offset deliveries, using a 1:1 relationship.

## 5.2 Modeling Assumptions

The following section describes the approach and key assumptions for regional groundwater analysis in the Friant Division and non-Friant Division regions.

The Schmidt method assumes a linear relationship is valid between contractor-wide pumping and drawdown. The relationships developed by Schmidt assume that each district is underlain by a homogeneous aquifer system that is a closed system and therefore is not hydraulically connected to surrounding areas. The Schmidt method assumes that the relationship between historical groundwater pumping and resulting groundwater levels holds true for future water management conditions resulting from both the No-Action Alternative and Proposed Action (Schmidt 2005b). Absolute values of changes in groundwater conditions (groundwater levels) will not be reported. Regional groundwater conditions will be assessed based on changes between the No-Action Alternative and Proposed Action. The Schmidt method assumes that groundwater supplies exist in each district to make up for the average annual net reductions in surface water deliveries resulting from the Proposed Action. However, it is recognized that the projected drawdown in the aquifer may not be sustainable in some contractor areas within the Friant Division.

Potential drawdown of the aquifer within the Friant Division was estimated by Schmidt (2005b) using a linear relationship with groundwater pumping. During litigation, Burt (2005) estimated gross irrigation groundwater pumping for the Friant Division, which is not corrected for well inefficiencies, and is the estimate of pumping used for irrigation scheduling as opposed to the estimate that would be used in water balance calculations. The estimates of gross irrigation groundwater pumping for 1987 and 2003 from Burt (2005) were used by Schmidt to develop Friant Division contractor relationships with estimates of the average annual drawdown per year. Estimates of pumping under existing conditions for the WY 2010 Interim Flows EA/IS are calculated as the current pumping condition (Schmidt 2005b) plus additional pumping needed to offset net reductions in Friant Division surface water deliveries.

Long-term average annual, wet period average annual, and drought period average annual surface water deliveries for each WMA were calculated from CalSim output data. Long-term average annual surface water deliveries were calculated for the entire simulation period in CalSim between 1922 and 2003. Wet period average annual surface water deliveries were calculated for the simulation period in CalSim between 1995 and 1998; these were a series of consecutive wet or normal-wet years according to the San Joaquin River Index. Drought period average annual surface water deliveries were calculated for the simulation period in CalSim between 1987 and 1992; these are a series of consecutive dry or normal-dry years according to the San Joaquin River Index. The three conditions were used to illustrate a potential maximum and minimum change in groundwater elevations due to reductions in surface water deliveries for different hydrologic conditions. Simulated surface water deliveries reported by WMA were disaggregated to contractor-level deliveries, using existing contract entitlements.

Potential changes in groundwater quality, land subsidence, and drainage were expressed qualitatively based on a review of known groundwater quality, land subsidence and drainage issues, and estimated changes in groundwater conditions (groundwater levels) associated with the Proposed Action.

### **5.3 Output Description**

Output from the analysis using the Schmidt tool and mass balance tool is discussed in this section.

Output from the regional groundwater tool for the Friant Division using the Schmidt approach is summarized in the Groundwater Modeling Output – Schmidt Method Attachment. The first table identifies the change in groundwater levels in feet per year by Friant Division contractors using the Schmidt method. The second table identifies groundwater pumping by Friant Division contractors using the Schmidt method. Not all of the 28 Friant Division contractors are represented in the output tables because historical information was not available for each of the contractors from Schmidt (2005b). Groundwater conditions for 15 contractors are represented in the attachment output tables. The remaining 13 Friant Division contractors are not represented in the attachment output tables.

## 6.0 Air Quality Modeling

Project-generated, reactive organic gases (ROG), nitrous oxides (NOX), particulate matter, up to 2.5 microns in size (PM<sub>2.5</sub>), and particulate matter, up to 10 microns in size (PM<sub>10</sub>), were modeled using the URBEMIS 2007 Version 9.2.4 computer program. This modeling was based on the assumption that invasive plant surveys and removal would begin in spring and fall 2011, respectively, and on default URBEMIS model settings. Survey crews would consist of two to three workers and would create approximately one trip per day per surveying crew. The survey period is unknown at this time but could last several months (3 months is assumed for modeling purposes). Vegetation-removal crews would consist of six to seven workers with one heavy piece of equipment per crew (i.e., bobcat or backhoe). Other crew members would use hand tools, chainsaws, and weed whackers. Vegetation removal would result in approximately one haul truck trip per day per crew to move vegetation to an as-yet-undetermined waste or composting facility. Vegetation-removal activities are expected to last approximately 3 months and could occur for up to 3 consecutive years (2011–2013). Trip generation rates input into the URBEMIS model are representative of the Proposed Action, and would result in approximately eight associated daily vehicle round trips per day (seven employees, one haul truck). A maximum of 10 crews is expected for vegetation removal, and approximately 1 acre of vegetation would be removed per day for all crews.

Some increased recreation (i.e., canoeing, kayaking, and fishing) could result from additional water flow, and could create additional vehicle trips in and downstream from the Restoration Area. These trips are assumed to already exist; however, instead of traveling to other areas in the San Joaquin River watershed, it is assumed that recreationists would be attracted to the newly watered river reaches. Because criteria pollutant emissions are regional pollutants, and trips to the Restoration Area would be diversions from other parts of the region (the San Joaquin Valley Air Basin), no net increase in criteria air pollutants in the region would occur. In addition, any new emissions from increased recreation activities would be similar to operational actions. Air quality modeling results are presented in the Air Quality Modeling Output – URBEMIS Attachment.

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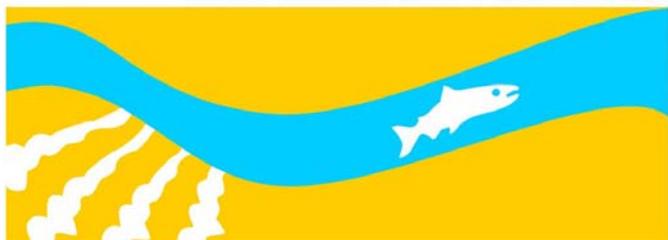
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## Attachment 1

# Water Operations Modeling Output – CalSim

## Modeling

**SAN JOAQUIN RIVER**  
RESTORATION PROGRAM





**Table 1: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration All Years**

Month	All Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	418	371	-47 (-11%)
Apr	444	382	-62 (-14%)
May	452	414	-38 (-9%)
Jun	446	425	-21 (-5%)
Jul	348	332	-16 (-5%)
Aug	245	233	-12 (-5%)
Sep	230	216	-15 (-6%)
Oct	241	215	-26 (-11%)
Nov	280	236	-44 (-16%)
Dec	324	286	-38 (-12%)
Jan	368	341	-27 (-7%)
Feb	387	367	-20 (-5%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 2: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	398	396	-3 (-1%)
Apr	383	368	-15 (-4%)
May	414	392	-23 (-5%)
Jun	522	520	-3 (0%)
Jul	506	501	-5 (-1%)
Aug	414	398	-15 (-4%)
Sep	361	330	-31 (-9%)
Oct	352	306	-46 (-13%)
Nov	378	314	-64 (-17%)
Dec	401	341	-60 (-15%)
Jan	430	390	-40 (-9%)
Feb	426	399	-27 (-6%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 3: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Normal-Wet**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	463	428	-35 (-8%)
Apr	475	412	-63 (-13%)
May	484	461	-22 (-5%)
Jun	496	495	-1 (0%)
Jul	392	382	-10 (-3%)
Aug	257	240	-18 (-7%)
Sep	228	204	-25 (-11%)
Oct	258	223	-35 (-14%)
Nov	324	270	-54 (-17%)
Dec	374	334	-40 (-11%)
Jan	403	381	-23 (-6%)
Feb	418	400	-18 (-4%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 4: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Normal-Dry**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	417	349	-68 (-16%)
Apr	466	378	-89 (-19%)
May	467	413	-55 (-12%)
Jun	421	380	-42 (-10%)
Jul	286	262	-24 (-9%)
Aug	181	173	-8 (-4%)
Sep	185	182	-3 (-2%)
Oct	196	184	-12 (-6%)
Nov	235	204	-32 (-13%)
Dec	290	261	-29 (-10%)
Jan	340	313	-27 (-8%)
Feb	369	346	-23 (-6%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 5: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	391	300	-91 (-23%)
Apr	449	371	-77 (-17%)
May	447	386	-61 (-14%)
Jun	362	317	-44 (-12%)
Jul	241	210	-31 (-13%)
Aug	166	161	-5 (-3%)
Sep	177	177	0 (0%)
Oct	179	167	-12 (-7%)
Nov	199	168	-31 (-16%)
Dec	239	209	-30 (-12%)
Jan	311	291	-20 (-6%)
Feb	321	312	-9 (-3%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 6: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Critical High**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	354	302	-52 (-15%)
Apr	394	343	-51 (-13%)
May	387	340	-47 (-12%)
Jun	290	257	-34 (-12%)
Jul	184	167	-17 (-9%)
Aug	147	141	-6 (-4%)
Sep	172	167	-5 (-3%)
Oct	169	159	-11 (-6%)
Nov	176	154	-22 (-13%)
Dec	210	187	-22 (-11%)
Jan	247	225	-22 (-9%)
Feb	344	314	-30 (-9%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 7: Monthly Averages of Simulated End-of-Month Millerton Lake storage (TAF) - Restoration Critical Low**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from
Mar	221	224	3 (2%)
Apr	242	246	3 (1%)
May	215	218	3 (1%)
Jun	182	185	2 (1%)
Jul	142	143	1 (1%)
Aug	131	131	0 (0%)
Sep	152	151	0 (0%)
Oct	151	139	-12 (-8%)
Nov	152	131	-21 (-14%)
Dec	229	208	-21 (-9%)
Jan	387	367	-21 (-5%)
Feb	395	393	-3 (-1%)

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 8: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs)  
- Restoration All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	1,064	906	-157 (-15%)
Apr	1,751	1,477	-273 (-16%)
May	2,215	2,051	-165 (-7%)
Jun	3,056	2,861	-195 (-6%)
Jul	2,998	2,869	-129 (-4%)
Aug	2,562	2,416	-146 (-6%)
Sep	1,486	1,415	-72 (-5%)
Oct	655	669	14 (2%)
Nov	223	235	13 (6%)
Dec	208	214	6 (3%)
Jan	376	368	-8 (-2%)
Feb	994	999	5 (0%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 9: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs)  
- Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	1,275	1,607	333 (26%)
Apr	1,830	2,200	370 (20%)
May	2,282	2,937	655 (29%)
Jun	3,998	4,196	198 (5%)
Jul	4,130	4,111	-19 (0%)
Aug	3,472	3,497	26 (1%)
Sep	2,236	2,306	70 (3%)
Oct	1,309	1,410	101 (8%)
Nov	534	586	53 (10%)
Dec	392	402	10 (3%)
Jan	807	704	-103 (-13%)
Feb	1,651	1,517	-134 (-8%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 10: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs) - Restoration Normal-Wet**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	1,379	1,080	-299 (-22%)
Apr	2,502	1,956	-546 (-22%)
May	3,066	2,827	-239 (-8%)
Jun	3,887	3,573	-314 (-8%)
Jul	3,310	3,305	-5 (0%)
Aug	2,900	2,896	-4 (0%)
Sep	1,625	1,620	-5 (0%)
Oct	575	577	2 (0%)
Nov	152	153	0 (0%)
Dec	280	158	-123 (-44%)
Jan	441	426	-15 (-3%)
Feb	1,072	1,188	116 (11%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 11: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs) - Restoration Normal-Dry**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	928	627	-301 (-32%)
Apr	1,557	1,155	-402 (-26%)
May	2,115	1,568	-547 (-26%)
Jun	2,508	2,220	-287 (-11%)
Jul	2,665	2,373	-292 (-11%)
Aug	2,352	2,075	-276 (-12%)
Sep	1,300	1,130	-170 (-13%)
Oct	468	434	-34 (-7%)
Nov	134	134	1 (0%)
Dec	130	280	149 (115%)
Jan	165	201	36 (22%)
Feb	811	763	-48 (-6%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 12: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	688	429	-259 (-38%)
Apr	1,030	629	-401 (-39%)
May	1,244	863	-381 (-31%)
Jun	1,939	1,632	-307 (-16%)
Jul	2,128	1,941	-187 (-9%)
Aug	1,757	1,327	-431 (-25%)
Sep	963	754	-209 (-22%)
Oct	424	463	39 (9%)
Nov	147	186	40 (27%)
Dec	54	29	-25 (-47%)
Jan	240	282	42 (17%)
Feb	648	671	24 (4%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 13: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs) - Restoration Critical High**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	411	307	-104 (-25%)
Apr	442	387	-55 (-12%)
May	625	545	-80 (-13%)
Jun	1,348	1,166	-182 (-14%)
Jul	1,683	1,454	-229 (-14%)
Aug	1,019	887	-132 (-13%)
Sep	600	527	-73 (-12%)
Oct	443	390	-53 (-12%)
Nov	192	140	-52 (-27%)
Dec	16	16	0 (0%)
Jan	16	16	0 (0%)
Feb	259	206	-54 (-21%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 14: Monthly Averages of Simulated Friant-Kern Canal Diversions (cfs) - Restoration Critical Low**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	171	173	2 (1%)
Apr	218	222	3 (1%)
May	301	305	4 (1%)
Jun	607	617	10 (2%)
Jul	751	763	13 (2%)
Aug	459	477	18 (4%)
Sep	303	307	4 (1%)
Oct	228	231	3 (1%)
Nov	118	0	-118 (-100%)
Dec	16	16	0 (0%)
Jan	16	16	0 (0%)
Feb	117	965	848 (723%)

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 15: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	79	83	4 (5%)
Apr	229	171	-57 (-25%)
May	645	561	-84 (-13%)
Jun	943	883	-60 (-6%)
Jul	1,026	980	-46 (-4%)
Aug	839	797	-42 (-5%)
Sep	294	281	-13 (-4%)
Oct	40	42	1 (3%)
Nov	8	11	3 (44%)
Dec	15	26	11 (74%)
Jan	31	41	10 (33%)
Feb	29	59	30 (102%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 16: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	77	221	144 (186%)
Apr	274	322	48 (18%)
May	1,128	1,128	0 (0%)
Jun	1,232	1,223	-9 (-1%)
Jul	1,232	1,231	-1 (0%)
Aug	1,166	1,190	24 (2%)
Sep	626	677	51 (8%)
Oct	130	152	22 (17%)
Nov	30	47	18 (59%)
Dec	33	75	42 (126%)
Jan	35	37	3 (7%)
Feb	36	47	10 (28%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 17: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Normal-Wet**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	138	130	-7 (-5%)
Apr	481	352	-129 (-27%)
May	855	743	-112 (-13%)
Jun	1,067	1,034	-32 (-3%)
Jul	1,083	1,117	34 (3%)
Aug	943	953	10 (1%)
Sep	352	337	-15 (-4%)
Oct	41	39	-2 (-5%)
Nov	5	5	0 (6%)
Dec	10	18	8 (76%)
Jan	54	75	21 (39%)
Feb	36	91	55 (155%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 18: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Normal-Dry**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	61	2	-60 (-98%)
Apr	88	3	-85 (-96%)
May	421	272	-148 (-35%)
Jun	878	786	-92 (-11%)
Jul	1,058	954	-104 (-10%)
Aug	766	659	-107 (-14%)
Sep	161	105	-55 (-34%)
Oct	8	0	-8 (-100%)
Nov	1	0	-1 (-100%)
Dec	18	19	1 (8%)
Jan	16	19	3 (20%)
Feb	29	48	19 (65%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 19: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	25	0	-25 (-100%)
Apr	21	2	-18 (-89%)
May	223	183	-41 (-18%)
Jun	659	533	-126 (-19%)
Jul	801	648	-153 (-19%)
Aug	554	449	-105 (-19%)
Sep	87	69	-18 (-21%)
Oct	0	0	0 (0%)
Nov	0	0	0 (0%)
Dec	0	0	0 (0%)
Jan	23	38	16 (70%)
Feb	17	26	9 (56%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 20: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Critical High**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	10	0	-10 (-100%)
Apr	0	0	0 (0%)
May	152	134	-17 (-12%)
Jun	434	378	-56 (-13%)
Jul	529	461	-68 (-13%)
Aug	367	301	-65 (-18%)
Sep	55	66	12 (21%)
Oct	0	0	0 (0%)
Nov	0	0	0 (0%)
Dec	0	0	0 (0%)
Jan	0	0	0 (0%)
Feb	1	0	-1 (-100%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 21: Monthly Averages of Simulated Madera Canal Diversions (cfs) - Restoration Critical Low**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from
Mar	0	0	0 (0%)
Apr	0	0	0 (0%)
May	81	82	1 (1%)
Jun	206	209	3 (1%)
Jul	253	257	4 (1%)
Aug	49	49	0 (0%)
Sep	156	159	3 (2%)
Oct	0	0	0 (0%)
Nov	0	0	0 (0%)
Dec	0	0	0 (0%)
Jan	0	0	0 (0%)
Feb	40	415	375 (938%)

Source: CALSIM II Modeling (Node D18B)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 22: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	453	458	5 (1%)
Nov	437	437	0 (0%)
Dec	595	591	-4 (-1%)
Jan	900	903	3 (0%)
Feb	1,157	1,163	6 (1%)
Mar	834	835	1 (0%)
Apr	746	689	-57 (-8%)
May	892	920	27 (3%)
Jun	924	929	4 (0%)
Jul	701	702	1 (0%)
Aug	473	474	1 (0%)
Sep	271	279	9 (3%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 23: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley Wet**

Month	San Joaquin Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	484	484	1 (0%)
Nov	479	479	0 (0%)
Dec	783	783	0 (0%)
Jan	1,687	1,698	10 (1%)
Feb	2,290	2,290	0 (0%)
Mar	1,849	1,853	3 (0%)
Apr	1,124	1,078	-46 (-4%)
May	2,003	2,017	14 (1%)
Jun	2,619	2,631	13 (0%)
Jul	2,004	2,001	-3 (0%)
Aug	1,186	1,188	2 (0%)
Sep	650	668	18 (3%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 24: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley Above Normal**

Month	San Joaquin Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	483	483	0 (0%)
Nov	497	497	0 (0%)
Dec	827	807	-20 (-2%)
Jan	958	958	0 (0%)
Feb	1,345	1,378	33 (2%)
Mar	609	609	0 (0%)
Apr	676	478	-198 (-29%)
May	700	777	77 (11%)
Jun	294	296	2 (1%)
Jul	262	272	10 (4%)
Aug	376	377	1 (0%)
Sep	245	262	17 (7%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 25: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley Below Normal**

Month	San Joaquin Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	378	378	0 (0%)
Nov	429	429	0 (0%)
Dec	420	420	0 (0%)
Jan	499	499	0 (0%)
Feb	497	497	0 (0%)
Mar	389	389	0 (0%)
Apr	728	700	-28 (-4%)
May	409	455	46 (11%)
Jun	280	280	0 (0%)
Jul	172	172	0 (0%)
Aug	128	128	0 (0%)
Sep	76	76	0 (0%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 26: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley Dry**

Month	San Joaquin Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	491	521	30 (6%)
Nov	407	407	0 (0%)
Dec	431	431	0 (0%)
Jan	435	435	0 (0%)
Feb	473	473	0 (0%)
Mar	343	343	0 (0%)
Apr	633	649	16 (2%)
May	389	398	9 (2%)
Jun	184	184	0 (0%)
Jul	126	126	0 (0%)
Aug	115	115	0 (0%)
Sep	63	63	0 (0%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 27: Monthly Averages of Simulated Merced River Inflow To San Joaquin River (cfs) - San Joaquin Valley Critical**

Month	San Joaquin Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	408	408	0 (0%)
Nov	348	348	0 (0%)
Dec	357	357	0 (0%)
Jan	363	363	0 (0%)
Feb	360	360	0 (0%)
Mar	295	295	0 (0%)
Apr	354	342	-12 (-3%)
May	220	218	-2 (-1%)
Jun	139	139	0 (0%)
Jul	83	83	0 (0%)
Aug	74	74	0 (0%)
Sep	54	54	0 (0%)

Source: CALSIM II Modeling (Node C566)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 28: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	632	705	73 (12%)
Nov	1,062	1,243	182 (17%)
Dec	1,506	1,399	-107 (-7%)
Jan	2,283	2,154	-128 (-6%)
Feb	3,334	3,190	-144 (-4%)
Mar	2,543	3,115	572 (22%)
Apr	2,114	2,619	505 (24%)
May	2,069	2,092	23 (1%)
Jun	1,623	1,698	75 (5%)
Jul	941	948	7 (1%)
Aug	537	544	7 (1%)
Sep	720	752	32 (4%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 29: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley Wet**

Month	San Joaquin Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	661	734	73 (11%)
Nov	1,148	1,310	163 (14%)
Dec	2,289	2,109	-180 (-8%)
Jan	4,975	4,616	-359 (-7%)
Feb	7,038	6,365	-673 (-10%)
Mar	6,202	6,416	214 (3%)
Apr	5,004	5,328	324 (6%)
May	5,359	5,258	-100 (-2%)
Jun	4,722	4,879	157 (3%)
Jul	2,771	2,773	2 (0%)
Aug	1,279	1,287	8 (1%)
Sep	1,132	1,174	42 (4%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 30: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley Above Normal**

Month	San Joaquin Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	688	761	73 (11%)
Nov	1,302	1,484	182 (14%)
Dec	2,048	1,769	-279 (-14%)
Jan	2,116	1,996	-120 (-6%)
Feb	3,396	3,347	-48 (-1%)
Mar	1,643	2,377	734 (45%)
Apr	1,355	2,298	943 (70%)
May	1,139	1,263	125 (11%)
Jun	498	544	46 (9%)
Jul	320	336	16 (5%)
Aug	449	456	7 (2%)
Sep	700	742	42 (6%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 31: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley Below Normal**

Month	San Joaquin Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	547	620	73 (13%)
Nov	1,017	1,235	218 (21%)
Dec	907	907	0 (0%)
Jan	930	930	0 (0%)
Feb	1,454	1,592	138 (9%)
Mar	989	1,721	732 (74%)
Apr	1,081	1,807	725 (67%)
May	749	842	93 (12%)
Jun	440	483	44 (10%)
Jul	215	221	6 (3%)
Aug	198	204	6 (3%)
Sep	533	558	24 (5%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 32: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley Dry**

Month	San Joaquin Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	673	776	102 (15%)
Nov	940	1,158	218 (23%)
Dec	903	903	0 (0%)
Jan	832	832	0 (0%)
Feb	1,184	1,322	138 (12%)
Mar	793	1,525	732 (92%)
Apr	874	1,429	555 (64%)
May	637	692	55 (9%)
Jun	283	327	44 (15%)
Jul	151	157	6 (4%)
Aug	180	186	6 (3%)
Sep	521	546	24 (5%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 33: Monthly Averages of Simulated San Joaquin River Below Merced River (cfs) - San Joaquin Valley Critical**

Month	San Joaquin Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	568	618	50 (9%)
Nov	826	976	150 (18%)
Dec	765	765	0 (0%)
Jan	690	690	0 (0%)
Feb	992	1,086	95 (10%)
Mar	640	1,327	686 (107%)
Apr	385	505	120 (31%)
May	301	326	25 (8%)
Jun	150	182	32 (21%)
Jul	49	54	5 (11%)
Aug	80	85	5 (7%)
Sep	437	454	17 (4%)

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 34: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,326	1,399	73 (6%)
Nov	1,648	1,831	183 (11%)
Dec	2,336	2,233	-103 (-4%)
Jan	3,549	3,421	-128 (-4%)
Feb	5,031	4,896	-135 (-3%)
Mar	4,679	5,256	577 (12%)
Apr	4,223	4,684	460 (11%)
May	4,003	4,026	23 (1%)
Jun	3,089	3,170	82 (3%)
Jul	2,079	2,087	7 (0%)
Aug	1,080	1,087	7 (1%)
Sep	1,289	1,321	32 (2%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 35: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley Wet**

Month	San Joaquin Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,421	1,494	73 (5%)
Nov	1,752	1,920	167 (10%)
Dec	3,339	3,159	-180 (-5%)
Jan	7,372	7,013	-358 (-5%)
Feb	10,477	9,827	-650 (-6%)
Mar	10,726	10,943	217 (2%)
Apr	8,884	9,173	289 (3%)
May	8,973	8,848	-124 (-1%)
Jun	8,647	8,832	186 (2%)
Jul	5,689	5,691	3 (0%)
Aug	2,068	2,076	8 (0%)
Sep	1,965	2,007	42 (2%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 36: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley Above Normal**

Month	San Joaquin Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,411	1,484	73 (5%)
Nov	2,105	2,287	182 (9%)
Dec	3,468	3,209	-259 (-7%)
Jan	3,737	3,617	-120 (-3%)
Feb	5,466	5,429	-36 (-1%)
Mar	4,043	4,785	743 (18%)
Apr	3,661	4,488	827 (23%)
May	3,031	3,165	133 (4%)
Jun	1,207	1,244	37 (3%)
Jul	922	938	16 (2%)
Aug	1,079	1,087	8 (1%)
Sep	1,350	1,391	42 (3%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 37: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley Below Normal**

Month	San Joaquin Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,200	1,272	73 (6%)
Nov	1,486	1,704	218 (15%)
Dec	1,493	1,493	0 (0%)
Jan	1,479	1,479	0 (0%)
Feb	2,163	2,301	138 (6%)
Mar	1,845	2,594	748 (41%)
Apr	2,692	3,386	694 (26%)
May	2,240	2,348	109 (5%)
Jun	905	949	44 (5%)
Jul	641	648	7 (1%)
Aug	652	659	7 (1%)
Sep	996	1,020	25 (2%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 38: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley Dry**

Month	San Joaquin Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,420	1,523	102 (7%)
Nov	1,484	1,702	218 (15%)
Dec	1,404	1,404	0 (0%)
Jan	1,380	1,380	0 (0%)
Feb	1,742	1,880	138 (8%)
Mar	1,567	2,296	728 (46%)
Apr	1,907	2,424	516 (27%)
May	1,654	1,732	78 (5%)
Jun	680	724	44 (6%)
Jul	526	533	7 (1%)
Aug	603	609	6 (1%)
Sep	967	991	25 (3%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 39: Monthly Averages of Simulated San Joaquin River Below Tuolumne River (cfs) - San Joaquin Valley Critical**

Month	San Joaquin Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	1,126	1,176	50 (4%)
Nov	1,298	1,449	150 (12%)
Dec	1,143	1,143	0 (0%)
Jan	1,071	1,071	0 (0%)
Feb	1,429	1,523	95 (7%)
Mar	1,077	1,764	686 (64%)
Apr	922	1,036	114 (12%)
May	861	883	22 (3%)
Jun	365	397	32 (9%)
Jul	255	260	5 (2%)
Aug	336	342	5 (2%)
Sep	717	735	17 (2%)

Source: CALSIM II Modeling (Node C630)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 40: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,445	1,467	21 (1%)
Nov	1,450	1,471	21 (1%)
Dec	1,476	1,496	20 (1%)
Jan	1,524	1,544	20 (1%)
Feb	1,574	1,593	20 (1%)
Mar	1,618	1,643	25 (2%)
Apr	1,615	1,640	25 (2%)
May	1,654	1,678	24 (1%)
Jun	1,668	1,691	23 (1%)
Jul	1,600	1,623	23 (1%)
Aug	1,516	1,539	23 (1%)
Sep	1,471	1,492	22 (1%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 41: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,621	1,634	13 (1%)
Nov	1,628	1,641	13 (1%)
Dec	1,672	1,684	13 (1%)
Jan	1,759	1,771	13 (1%)
Feb	1,829	1,840	11 (1%)
Mar	1,907	1,917	10 (1%)
Apr	1,949	1,960	10 (1%)
May	2,066	2,076	10 (0%)
Jun	2,122	2,132	10 (0%)
Jul	2,049	2,058	9 (0%)
Aug	1,937	1,946	9 (0%)
Sep	1,866	1,873	8 (0%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 42: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,360	1,377	17 (1%)
Nov	1,382	1,398	16 (1%)
Dec	1,420	1,433	13 (1%)
Jan	1,494	1,507	13 (1%)
Feb	1,566	1,580	14 (1%)
Mar	1,655	1,670	15 (1%)
Apr	1,656	1,671	15 (1%)
May	1,728	1,742	14 (1%)
Jun	1,760	1,772	12 (1%)
Jul	1,693	1,704	11 (1%)
Aug	1,612	1,623	11 (1%)
Sep	1,573	1,584	11 (1%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 43: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,409	1,439	30 (2%)
Nov	1,412	1,442	30 (2%)
Dec	1,429	1,459	30 (2%)
Jan	1,464	1,493	29 (2%)
Feb	1,523	1,553	30 (2%)
Mar	1,563	1,597	34 (2%)
Apr	1,558	1,591	33 (2%)
May	1,617	1,648	30 (2%)
Jun	1,631	1,662	31 (2%)
Jul	1,561	1,592	31 (2%)
Aug	1,481	1,511	31 (2%)
Sep	1,445	1,474	30 (2%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 44: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,499	1,517	18 (1%)
Nov	1,496	1,514	18 (1%)
Dec	1,506	1,523	17 (1%)
Jan	1,519	1,536	17 (1%)
Feb	1,546	1,564	18 (1%)
Mar	1,564	1,590	26 (2%)
Apr	1,530	1,557	27 (2%)
May	1,493	1,519	25 (2%)
Jun	1,468	1,493	25 (2%)
Jul	1,403	1,427	25 (2%)
Aug	1,334	1,359	24 (2%)
Sep	1,302	1,326	25 (2%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 45: Monthly Averages of Simulated End-of-Month New Melones Reservoir storage (TAF) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	1,112	1,149	37 (3%)
Nov	1,108	1,144	36 (3%)
Dec	1,115	1,151	36 (3%)
Jan	1,124	1,160	36 (3%)
Feb	1,128	1,165	37 (3%)
Mar	1,098	1,153	55 (5%)
Apr	1,042	1,097	55 (5%)
May	973	1,027	54 (6%)
Jun	932	984	52 (6%)
Jul	877	928	52 (6%)
Aug	822	873	51 (6%)
Sep	795	846	51 (6%)

Source: CALSIM II Modeling (Node S10)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 46: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	711	714	3 (0%)
Nov	519	526	7 (1%)
Dec	587	599	13 (2%)
Jan	669	671	2 (0%)
Feb	894	894	0 (0%)
Mar	835	753	-81 (-10%)
Apr	1,200	1,197	-3 (0%)
May	1,148	1,168	20 (2%)
Jun	969	977	8 (1%)
Jul	606	611	4 (1%)
Aug	581	581	1 (0%)
Sep	624	631	7 (1%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 47: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	877	880	3 (0%)
Nov	708	712	4 (1%)
Dec	908	912	4 (0%)
Jan	1,282	1,282	0 (0%)
Feb	1,734	1,771	37 (2%)
Mar	1,581	1,593	12 (1%)
Apr	1,710	1,708	-2 (0%)
May	1,624	1,634	10 (1%)
Jun	1,960	1,960	-1 (0%)
Jul	1,102	1,113	12 (1%)
Aug	1,002	1,003	0 (0%)
Sep	1,116	1,137	21 (2%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 48: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	577	581	4 (1%)
Nov	389	404	15 (4%)
Dec	510	565	55 (11%)
Jan	513	514	2 (0%)
Feb	785	770	-15 (-2%)
Mar	541	521	-20 (-4%)
Apr	1,335	1,333	-2 (0%)
May	1,241	1,259	18 (1%)
Jun	774	803	29 (4%)
Jul	417	417	0 (0%)
Aug	417	417	0 (0%)
Sep	443	444	1 (0%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 49: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	688	692	3 (0%)
Nov	453	455	2 (0%)
Dec	438	440	2 (0%)
Jan	391	395	5 (1%)
Feb	501	486	-15 (-3%)
Mar	490	423	-68 (-14%)
Apr	1,151	1,175	24 (2%)
May	1,118	1,157	39 (3%)
Jun	675	660	-15 (-2%)
Jul	433	433	0 (0%)
Aug	413	413	0 (0%)
Sep	420	420	0 (0%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 50: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	689	692	3 (0%)
Nov	455	466	11 (2%)
Dec	445	456	11 (2%)
Jan	381	385	3 (1%)
Feb	404	383	-21 (-5%)
Mar	436	307	-129 (-30%)
Apr	852	828	-25 (-3%)
May	812	832	21 (3%)
Jun	345	359	13 (4%)
Jul	349	350	1 (0%)
Aug	373	373	0 (0%)
Sep	381	381	0 (0%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 51: Monthly Averages of Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	549	550	1 (0%)
Nov	408	415	6 (2%)
Dec	352	358	6 (2%)
Jan	256	258	2 (1%)
Feb	378	359	-18 (-5%)
Mar	510	221	-289 (-57%)
Apr	537	531	-7 (-1%)
May	563	583	20 (4%)
Jun	294	322	28 (10%)
Jul	312	312	1 (0%)
Aug	341	343	2 (1%)
Sep	340	340	0 (0%)

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 52: Monthly Averages of Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,498	2,575	76 (3%)
Nov	2,556	2,746	190 (7%)
Dec	3,366	3,275	-90 (-3%)
Jan	4,793	4,667	-126 (-3%)
Feb	6,459	6,324	-135 (-2%)
Mar	6,343	6,838	495 (8%)
Apr	6,101	6,559	457 (7%)
May	6,076	6,120	43 (1%)
Jun	4,696	4,786	90 (2%)
Jul	3,349	3,360	11 (0%)
Aug	2,198	2,205	8 (0%)
Sep	2,412	2,451	39 (2%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 53: Monthly Averages of Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,924	3,001	77 (3%)
Nov	3,298	3,454	156 (5%)
Dec	5,311	5,114	-197 (-4%)
Jan	9,288	8,993	-295 (-3%)
Feb	11,634	11,263	-371 (-3%)
Mar	12,393	12,784	391 (3%)
Apr	10,673	11,124	451 (4%)
May	11,031	10,930	-101 (-1%)
Jun	9,636	9,617	-19 (0%)
Jul	6,842	6,856	15 (0%)
Aug	3,430	3,438	8 (0%)
Sep	3,477	3,539	62 (2%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 54: Monthly Averages of Simulated San Joaquin River Flow  
Upstream of Vernalis (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,113	2,189	77 (4%)
Nov	2,105	2,332	227 (11%)
Dec	3,136	2,903	-233 (-7%)
Jan	4,424	4,194	-230 (-5%)
Feb	6,378	6,322	-56 (-1%)
Mar	5,804	6,314	510 (9%)
Apr	5,975	6,540	565 (9%)
May	5,403	5,695	292 (5%)
Jun	5,006	5,470	464 (9%)
Jul	2,871	2,877	7 (0%)
Aug	2,093	2,101	8 (0%)
Sep	2,338	2,371	33 (1%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 55: Monthly Averages of Simulated San Joaquin River Flow  
Upstream of Vernalis (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,442	2,518	76 (3%)
Nov	2,334	2,554	220 (9%)
Dec	2,823	2,841	18 (1%)
Jan	2,963	2,963	0 (0%)
Feb	5,790	5,531	-258 (-4%)
Mar	4,560	5,196	636 (14%)
Apr	5,290	5,950	660 (12%)
May	5,097	5,124	26 (1%)
Jun	2,387	2,431	44 (2%)
Jul	1,848	1,865	18 (1%)
Aug	1,911	1,918	6 (0%)
Sep	2,122	2,160	38 (2%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 56: Monthly Averages of Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,431	2,524	93 (4%)
Nov	2,310	2,526	216 (9%)
Dec	2,171	2,182	11 (1%)
Jan	2,084	2,087	3 (0%)
Feb	2,512	2,622	110 (4%)
Mar	2,392	2,992	600 (25%)
Apr	3,099	3,558	459 (15%)
May	2,964	3,059	95 (3%)
Jun	1,547	1,603	56 (4%)
Jul	1,356	1,365	9 (1%)
Aug	1,434	1,441	8 (1%)
Sep	1,811	1,835	24 (1%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 57: Monthly Averages of Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,128	2,177	49 (2%)
Nov	2,029	2,181	152 (7%)
Dec	1,805	1,812	6 (0%)
Jan	1,624	1,626	2 (0%)
Feb	2,028	2,101	73 (4%)
Mar	1,781	2,164	382 (21%)
Apr	1,774	1,896	122 (7%)
May	1,825	1,874	49 (3%)
Jun	1,096	1,154	57 (5%)
Jul	999	1,003	4 (0%)
Aug	1,114	1,120	6 (1%)
Sep	1,418	1,435	16 (1%)

Source: CALSIM II Modeling (Node C637)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 58: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,484	2,561	76 (3%)
Nov	2,555	2,745	190 (7%)
Dec	3,366	3,276	-90 (-3%)
Jan	4,794	4,667	-126 (-3%)
Feb	6,452	6,317	-135 (-2%)
Mar	6,324	6,819	495 (8%)
Apr	6,054	6,511	457 (8%)
May	6,010	6,054	43 (1%)
Jun	4,628	4,719	90 (2%)
Jul	3,255	3,266	11 (0%)
Aug	2,113	2,121	8 (0%)
Sep	2,366	2,405	39 (2%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 59: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,911	2,988	77 (3%)
Nov	3,297	3,453	156 (5%)
Dec	5,312	5,114	-197 (-4%)
Jan	9,288	8,993	-295 (-3%)
Feb	11,628	11,257	-371 (-3%)
Mar	12,374	12,766	391 (3%)
Apr	10,629	11,080	451 (4%)
May	10,969	10,868	-101 (-1%)
Jun	9,573	9,554	-19 (0%)
Jul	6,754	6,769	15 (0%)
Aug	3,350	3,359	9 (0%)
Sep	3,433	3,496	62 (2%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 60: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,099	2,176	77 (4%)
Nov	2,104	2,331	227 (11%)
Dec	3,136	2,903	-233 (-7%)
Jan	4,425	4,194	-230 (-5%)
Feb	6,371	6,315	-56 (-1%)
Mar	5,784	6,295	510 (9%)
Apr	5,929	6,494	564 (10%)
May	5,339	5,631	292 (5%)
Jun	4,941	5,405	464 (9%)
Jul	2,780	2,787	7 (0%)
Aug	2,010	2,019	8 (0%)
Sep	2,294	2,327	33 (1%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 61: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,428	2,504	76 (3%)
Nov	2,333	2,553	220 (9%)
Dec	2,823	2,841	18 (1%)
Jan	2,963	2,963	0 (0%)
Feb	5,783	5,525	-258 (-4%)
Mar	4,541	5,177	636 (14%)
Apr	5,242	5,902	659 (13%)
May	5,031	5,058	26 (1%)
Jun	2,319	2,364	44 (2%)
Jul	1,753	1,771	18 (1%)
Aug	1,826	1,833	6 (0%)
Sep	2,077	2,115	38 (2%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 62: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,417	2,510	93 (4%)
Nov	2,308	2,525	216 (9%)
Dec	2,171	2,182	11 (1%)
Jan	2,084	2,087	3 (0%)
Feb	2,505	2,615	110 (4%)
Mar	2,372	2,972	600 (25%)
Apr	3,050	3,508	458 (15%)
May	2,895	2,990	96 (3%)
Jun	1,477	1,534	57 (4%)
Jul	1,258	1,267	10 (1%)
Aug	1,346	1,354	8 (1%)
Sep	1,763	1,787	24 (1%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 63: Monthly Averages of Simulated San Joaquin River Inflows to Delta (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	2,113	2,162	49 (2%)
Nov	2,028	2,180	152 (7%)
Dec	1,806	1,812	6 (0%)
Jan	1,624	1,626	2 (0%)
Feb	2,021	2,094	73 (4%)
Mar	1,760	2,143	382 (22%)
Apr	1,722	1,844	122 (7%)
May	1,752	1,802	49 (3%)
Jun	1,022	1,080	57 (6%)
Jul	896	900	4 (0%)
Aug	1,022	1,028	6 (1%)
Sep	1,368	1,384	16 (1%)

Source: CALSIM II Modeling (Node C644)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 64: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	5,037	5,080	43 (1%)
Nov	8,791	8,908	117 (1%)
Dec	21,660	21,583	-77 (0%)
Jan	39,507	39,369	-138 (0%)
Feb	51,064	50,660	-404 (-1%)
Mar	41,682	41,894	212 (1%)
Apr	26,811	26,942	131 (0%)
May	20,246	20,270	24 (0%)
Jun	13,225	13,230	5 (0%)
Jul	8,597	8,589	-8 (0%)
Aug	4,469	4,446	-23 (-1%)
Sep	5,223	5,239	16 (0%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 65: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	6,568	6,596	28 (0%)
Nov	13,754	13,914	160 (1%)
Dec	45,406	45,277	-129 (0%)
Jan	82,133	81,757	-376 (0%)
Feb	95,471	94,904	-567 (-1%)
Mar	78,004	78,024	20 (0%)
Apr	49,563	49,575	11 (0%)
May	37,209	37,097	-113 (0%)
Jun	23,603	23,466	-137 (-1%)
Jul	11,838	11,818	-20 (0%)
Aug	5,098	5,100	1 (0%)
Sep	9,240	9,318	78 (1%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 66: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	4,159	4,263	104 (2%)
Nov	9,461	9,672	212 (2%)
Dec	17,659	17,397	-262 (-1%)
Jan	45,344	45,197	-147 (0%)
Feb	59,951	59,842	-109 (0%)
Mar	51,075	51,434	359 (1%)
Apr	27,142	27,309	167 (1%)
May	21,704	21,975	271 (1%)
Jun	12,896	13,240	344 (3%)
Jul	10,031	10,030	-1 (0%)
Aug	4,000	4,000	0 (0%)
Sep	3,943	3,931	-12 (0%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 67: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	4,528	4,553	25 (1%)
Nov	5,571	5,660	89 (2%)
Dec	11,919	11,817	-102 (-1%)
Jan	19,057	19,000	-57 (0%)
Feb	35,077	34,674	-403 (-1%)
Mar	22,940	23,140	200 (1%)
Apr	18,496	18,833	337 (2%)
May	14,082	14,130	48 (0%)
Jun	8,930	8,953	22 (0%)
Jul	8,140	8,152	13 (0%)
Aug	4,172	4,184	11 (0%)
Sep	3,513	3,491	-22 (-1%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 68: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	4,285	4,343	58 (1%)
Nov	6,461	6,535	74 (1%)
Dec	8,459	8,519	60 (1%)
Jan	10,993	10,995	3 (0%)
Feb	20,059	19,422	-636 (-3%)
Mar	18,145	18,599	454 (3%)
Apr	12,288	12,494	206 (2%)
May	9,634	9,663	29 (0%)
Jun	6,790	6,785	-5 (0%)
Jul	6,157	6,131	-26 (0%)
Aug	4,191	4,143	-48 (-1%)
Sep	3,085	3,069	-15 (0%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 69: Monthly Averages of Simulated Delta Outflow (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	4,315	4,330	15 (0%)
Nov	4,619	4,646	26 (1%)
Dec	5,376	5,418	43 (1%)
Jan	7,941	8,022	81 (1%)
Feb	11,120	11,122	2 (0%)
Mar	10,759	10,892	132 (1%)
Apr	8,669	8,672	4 (0%)
May	5,141	5,182	42 (1%)
Jun	5,729	5,696	-33 (-1%)
Jul	4,332	4,345	13 (0%)
Aug	4,334	4,236	-98 (-2%)
Sep	3,000	3,000	0 (0%)

Source: CALSIM II Modeling (Node C406)

Notes:

Simulation Period: WY 1922 -2003

(% ) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 70: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	8,546	8,618	72 (1%)
Nov	8,863	8,986	123 (1%)
Dec	9,987	10,054	67 (1%)
Jan	10,563	10,577	14 (0%)
Feb	9,078	9,302	224 (2%)
Mar	7,950	8,253	302 (4%)
Apr	5,278	5,549	271 (5%)
May	5,098	5,125	27 (1%)
Jun	6,250	6,257	8 (0%)
Jul	8,927	8,956	29 (0%)
Aug	8,765	8,752	-13 (0%)
Sep	9,055	9,054	0 (0%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 71: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	9,509	9,633	124 (1%)
Nov	10,313	10,449	136 (1%)
Dec	11,388	11,440	52 (0%)
Jan	11,320	11,368	48 (0%)
Feb	10,570	10,831	262 (2%)
Mar	9,243	9,687	444 (5%)
Apr	7,598	7,950	352 (5%)
May	7,416	7,429	13 (0%)
Jun	8,189	8,179	-10 (0%)
Jul	10,124	10,157	33 (0%)
Aug	10,945	10,876	-69 (-1%)
Sep	10,893	10,901	8 (0%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 72: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	8,277	8,356	79 (1%)
Nov	9,019	9,057	38 (0%)
Dec	10,237	10,354	117 (1%)
Jan	11,083	11,038	-44 (0%)
Feb	10,354	10,442	88 (1%)
Mar	10,059	10,205	146 (1%)
Apr	6,462	6,825	363 (6%)
May	5,605	5,653	48 (1%)
Jun	7,190	7,243	53 (1%)
Jul	8,710	8,702	-8 (0%)
Aug	10,850	10,817	-34 (0%)
Sep	10,845	10,823	-22 (0%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 73: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	8,722	8,736	14 (0%)
Nov	9,218	9,273	56 (1%)
Dec	9,462	9,561	99 (1%)
Jan	10,889	10,943	54 (0%)
Feb	9,237	9,351	114 (1%)
Mar	7,832	8,212	380 (5%)
Apr	5,419	5,751	333 (6%)
May	5,040	5,082	42 (1%)
Jun	6,563	6,597	35 (1%)
Jul	9,615	9,664	49 (1%)
Aug	9,428	9,498	70 (1%)
Sep	9,736	9,735	-1 (0%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 74: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	8,035	8,093	58 (1%)
Nov	8,066	8,202	136 (2%)
Dec	9,971	10,053	82 (1%)
Jan	10,274	10,309	35 (0%)
Feb	7,990	8,438	448 (6%)
Mar	7,119	7,344	225 (3%)
Apr	3,277	3,472	195 (6%)
May	3,530	3,554	24 (1%)
Jun	4,682	4,699	17 (0%)
Jul	9,335	9,308	-27 (0%)
Aug	7,413	7,527	114 (2%)
Sep	7,541	7,588	47 (1%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 75: Monthly Averages of Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	7,291	7,330	39 (1%)
Nov	6,346	6,586	240 (4%)
Dec	7,335	7,324	-11 (0%)
Jan	8,456	8,379	-78 (-1%)
Feb	6,020	6,089	69 (1%)
Mar	4,423	4,600	177 (4%)
Apr	1,902	1,949	47 (2%)
May	1,989	2,014	25 (1%)
Jun	3,093	3,050	-43 (-1%)
Jul	5,134	5,252	118 (2%)
Aug	3,212	3,055	-157 (-5%)
Sep	4,756	4,691	-64 (-1%)

Source: CALSIM II Modeling (Node D418 + D419)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 76: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-7,777	-7,824	-48 (1%)
Nov	-7,948	-8,015	-66 (1%)
Dec	-7,570	-7,682	-113 (1%)
Jan	-7,055	-7,131	-75 (1%)
Feb	-4,987	-5,282	-295 (6%)
Mar	-4,248	-4,300	-51 (1%)
Apr	-4,802	-5,021	-219 (5%)
May	-4,980	-5,002	-22 (0%)
Jun	-5,195	-5,166	29 (-1%)
Jul	-8,178	-8,201	-23 (0%)
Aug	-8,082	-8,067	15 (0%)
Sep	-8,425	-8,415	10 (0%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 77: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-8,560	-8,657	-97 (1%)
Nov	-9,092	-9,180	-87 (1%)
Dec	-7,768	-7,937	-169 (2%)
Jan	-5,161	-5,353	-192 (4%)
Feb	-3,534	-4,027	-493 (14%)
Mar	-2,127	-2,365	-238 (11%)
Apr	-6,488	-6,783	-295 (5%)
May	-6,733	-6,754	-20 (0%)
Jun	-5,006	-5,004	2 (0%)
Jul	-7,875	-7,900	-25 (0%)
Aug	-9,655	-9,587	68 (-1%)
Sep	-9,888	-9,879	9 (0%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 78: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-7,613	-7,668	-55 (1%)
Nov	-8,190	-8,167	23 (0%)
Dec	-7,928	-8,143	-215 (3%)
Jan	-7,775	-7,841	-66 (1%)
Feb	-6,057	-6,179	-123 (2%)
Mar	-6,594	-6,492	102 (-2%)
Apr	-5,896	-6,193	-296 (5%)
May	-5,487	-5,509	-22 (0%)
Jun	-6,022	-5,884	138 (-2%)
Jul	-8,186	-8,176	10 (0%)
Aug	-10,101	-10,066	35 (0%)
Sep	-10,100	-10,071	29 (0%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 79: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-7,987	-7,980	7 (0%)
Nov	-8,358	-8,354	5 (0%)
Dec	-7,421	-7,503	-82 (1%)
Jan	-8,454	-8,503	-49 (1%)
Feb	-5,672	-5,896	-224 (4%)
Mar	-5,179	-5,232	-52 (1%)
Apr	-5,045	-5,306	-261 (5%)
May	-5,040	-5,077	-37 (1%)
Jun	-6,488	-6,503	-15 (0%)
Jul	-9,484	-9,523	-39 (0%)
Aug	-8,838	-8,901	-63 (1%)
Sep	-9,113	-9,102	11 (0%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 80: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-7,297	-7,328	-30 (0%)
Nov	-7,271	-7,343	-72 (1%)
Dec	-8,196	-8,266	-70 (1%)
Jan	-8,305	-8,335	-30 (0%)
Feb	-6,091	-6,448	-358 (6%)
Mar	-5,542	-5,470	73 (-1%)
Apr	-3,214	-3,361	-147 (5%)
May	-3,792	-3,807	-15 (0%)
Jun	-5,024	-5,017	7 (0%)
Jul	-9,343	-9,314	29 (0%)
Aug	-7,047	-7,151	-104 (1%)
Sep	-7,130	-7,168	-38 (1%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 81: Monthly Averages of Simulated Old & Middle River Flow (cfs) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (cfs)	Proposed Action (cfs)	Change from No Action (cfs)
Oct	-6,716	-6,739	-23 (0%)
Nov	-5,765	-5,951	-186 (3%)
Dec	-6,017	-6,004	13 (0%)
Jan	-6,936	-6,864	71 (-1%)
Feb	-4,611	-4,639	-28 (1%)
Mar	-3,472	-3,457	15 (0%)
Apr	-2,156	-2,191	-35 (2%)
May	-2,385	-2,404	-19 (1%)
Jun	-3,526	-3,463	63 (-2%)
Jul	-5,555	-5,664	-109 (2%)
Aug	-3,327	-3,176	150 (-5%)
Sep	-4,720	-4,656	65 (-1%)

Source: CALSIM II Modeling (Node OMFLOW)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 82: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	85	85	0 (0%)
Nov	86	85	0 (0%)
Dec	83	83	0 (0%)
Jan	78	78	0 (0%)
Feb	71	71	0 (0%)
Mar	66	66	0 (0%)
Apr	65	65	0 (0%)
May	68	68	0 (0%)
Jun	71	71	0 (0%)
Jul	75	75	0 (0%)
Aug	78	78	0 (0%)
Sep	84	84	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 83: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	83	83	0 (0%)
Nov	83	83	0 (0%)
Dec	80	80	0 (0%)
Jan	69	69	0 (0%)
Feb	60	60	0 (0%)
Mar	56	56	0 (0%)
Apr	56	56	0 (0%)
May	59	59	0 (0%)
Jun	62	62	0 (0%)
Jul	67	67	0 (0%)
Aug	73	73	0 (0%)
Sep	81	81	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 84: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	85	85	0 (0%)
Nov	86	86	0 (0%)
Dec	83	83	0 (0%)
Jan	79	79	0 (0%)
Feb	68	68	0 (0%)
Mar	62	62	0 (0%)
Apr	60	60	0 (0%)
May	65	64	0 (0%)
Jun	68	67	0 (0%)
Jul	73	73	0 (0%)
Aug	76	75	0 (0%)
Sep	83	83	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 85: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	85	85	0 (0%)
Nov	86	86	0 (0%)
Dec	85	85	0 (0%)
Jan	81	81	0 (0%)
Feb	75	75	0 (0%)
Mar	68	68	0 (0%)
Apr	68	68	0 (0%)
May	70	70	0 (0%)
Jun	72	72	0 (0%)
Jul	76	76	0 (0%)
Aug	78	78	0 (0%)
Sep	84	84	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 86: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	87	87	0 (0%)
Nov	87	87	0 (0%)
Dec	85	85	0 (0%)
Jan	82	82	0 (0%)
Feb	79	79	0 (0%)
Mar	73	74	0 (0%)
Apr	72	72	0 (0%)
May	74	74	0 (0%)
Jun	76	76	0 (0%)
Jul	80	80	0 (0%)
Aug	81	82	0 (0%)
Sep	85	85	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 87: Monthly Averages of Simulated Previous Month X2 Position (km ) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (km)	Proposed Action (km)	Change from No Action (km)
Oct	87	87	0 (0%)
Nov	87	87	0 (0%)
Dec	86	86	0 (0%)
Jan	85	85	0 (0%)
Feb	82	82	0 (0%)
Mar	78	78	0 (0%)
Apr	77	77	0 (0%)
May	78	78	0 (0%)
Jun	82	82	0 (0%)
Jul	83	83	0 (0%)
Aug	85	85	0 (0%)
Sep	86	86	0 (0%)

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 88: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration All Years**

Month	All Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	501	529	28 (6%)
Apr	460	484	25 (5%)
May	426	463	36 (8%)
Jun	414	437	23 (6%)
Jul	392	392	0 (0%)
Aug	441	441	0 (0%)
Sep	497	497	0 (0%)
Oct	517	519	2 (0%)
Nov	551	552	1 (0%)
Dec	593	596	3 (1%)
Jan	497	527	29 (6%)
Feb	462	502	40 (9%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 89: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	153	251	98 (64%)
Apr	132	221	89 (67%)
May	114	211	97 (85%)
Jun	143	235	92 (64%)
Jul	236	237	1 (0%)
Aug	358	358	0 (0%)
Sep	383	383	0 (0%)
Oct	386	397	11 (3%)
Nov	439	439	0 (0%)
Dec	457	457	0 (0%)
Jan	384	433	48 (13%)
Feb	437	453	17 (4%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 90: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Normal-Wet**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	471	500	28 (6%)
Apr	398	421	24 (6%)
May	351	407	56 (16%)
Jun	390	408	18 (5%)
Jul	350	350	0 (0%)
Aug	376	376	0 (0%)
Sep	427	427	0 (0%)
Oct	472	472	0 (0%)
Nov	527	527	0 (0%)
Dec	529	538	9 (2%)
Jan	391	428	37 (10%)
Feb	397	436	39 (10%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 91: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Normal-Dry**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	601	602	1 (0%)
Apr	541	541	0 (0%)
May	508	509	1 (0%)
Jun	464	464	0 (0%)
Jul	388	388	0 (0%)
Aug	451	451	0 (0%)
Sep	535	535	0 (0%)
Oct	555	555	0 (0%)
Nov	564	568	4 (1%)
Dec	598	600	1 (0%)
Jan	581	582	1 (0%)
Feb	491	525	34 (7%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 92: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	711	711	0 (0%)
Apr	713	714	1 (0%)
May	680	680	0 (0%)
Jun	603	603	0 (0%)
Jul	568	568	0 (0%)
Aug	580	580	0 (0%)
Sep	643	643	0 (0%)
Oct	639	639	0 (0%)
Nov	654	654	0 (0%)
Dec	777	777	0 (0%)
Jan	600	657	58 (10%)
Feb	509	611	102 (20%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 93: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Critical High**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	766	766	0 (0%)
Apr	805	805	0 (0%)
May	782	782	0 (0%)
Jun	685	684	0 (0%)
Jul	676	676	0 (0%)
Aug	641	641	0 (0%)
Sep	677	677	0 (0%)
Oct	667	667	0 (0%)
Nov	700	700	0 (0%)
Dec	851	851	0 (0%)
Jan	719	719	0 (0%)
Feb	724	724	0 (0%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 94: Monthly Averages of Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Restoration Critical Low**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	814	814	0 (0%)
Apr	889	889	0 (0%)
May	882	882	0 (0%)
Jun	766	766	0 (0%)
Jul	785	785	0 (0%)
Aug	693	693	0 (0%)
Sep	699	699	0 (0%)
Oct	690	690	0 (0%)
Nov	742	742	0 (0%)
Dec	924	924	0 (0%)
Jan	732	732	0 (0%)
Feb	115	118	3 (3%)

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 95: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration All Years**

Month	All Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	501	199	-302 (-60%)
Apr	460	472	12 (3%)
May	426	394	-32 (-7%)
Jun	414	378	-36 (-9%)
Jul	392	380	-12 (-3%)
Aug	441	427	-14 (-3%)
Sep	497	463	-34 (-7%)
Oct	517	435	-82 (-16%)
Nov	551	303	-247 (-45%)
Dec	593	596	3 (1%)
Jan	497	527	29 (6%)
Feb	462	284	-178 (-39%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 96: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	153	134	-19 (-12%)
Apr	132	108	-24 (-18%)
May	114	102	-12 (-11%)
Jun	143	101	-43 (-30%)
Jul	236	231	-5 (-2%)
Aug	358	347	-11 (-3%)
Sep	383	357	-26 (-7%)
Oct	386	336	-51 (-13%)
Nov	439	243	-196 (-45%)
Dec	457	457	0 (0%)
Jan	384	433	48 (13%)
Feb	437	249	-188 (-43%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 97: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Normal-Wet**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	471	187	-284 (-60%)
Apr	398	118	-280 (-70%)
May	351	360	10 (3%)
Jun	390	372	-19 (-5%)
Jul	350	339	-11 (-3%)
Aug	376	364	-12 (-3%)
Sep	427	397	-30 (-7%)
Oct	472	400	-72 (-15%)
Nov	527	298	-229 (-43%)
Dec	529	538	9 (2%)
Jan	391	428	37 (10%)
Feb	397	262	-135 (-34%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 98: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Normal-Dry**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	601	208	-393 (-65%)
Apr	541	982	441 (82%)
May	508	445	-63 (-12%)
Jun	464	420	-44 (-9%)
Jul	388	374	-13 (-3%)
Aug	451	435	-16 (-4%)
Sep	535	494	-41 (-8%)
Oct	555	458	-97 (-17%)
Nov	564	293	-271 (-48%)
Dec	598	600	1 (0%)
Jan	581	582	1 (0%)
Feb	491	275	-216 (-44%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 99: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	711	227	-483 (-68%)
Apr	713	528	-185 (-26%)
May	680	586	-94 (-14%)
Jun	603	539	-64 (-11%)
Jul	568	546	-22 (-4%)
Aug	580	557	-23 (-4%)
Sep	643	590	-53 (-8%)
Oct	639	538	-102 (-16%)
Nov	654	368	-287 (-44%)
Dec	777	777	0 (0%)
Jan	600	657	58 (10%)
Feb	509	355	-153 (-30%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 100: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Critical High**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	766	232	-534 (-70%)
Apr	805	805	0 (0%)
May	782	782	0 (0%)
Jun	685	684	0 (0%)
Jul	676	676	0 (0%)
Aug	641	641	0 (0%)
Sep	677	677	0 (0%)
Oct	667	566	-101 (-15%)
Nov	700	424	-276 (-39%)
Dec	851	851	0 (0%)
Jan	719	719	0 (0%)
Feb	724	435	-288 (-40%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 101: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Restoration Critical Low**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	814	814	0 (0%)
Apr	889	889	0 (0%)
May	882	882	0 (0%)
Jun	766	766	0 (0%)
Jul	785	785	0 (0%)
Aug	693	693	0 (0%)
Sep	699	699	0 (0%)
Oct	690	539	-151 (-22%)
Nov	742	388	-354 (-48%)
Dec	924	924	0 (0%)
Jan	732	732	0 (0%)
Feb	115	116	0 (0%)

Source: CALSIM II Modeling (Node EC\_608\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 102: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration All**

Month	All Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	1,037	745	-291 (-28%)
Apr	878	655	-223 (-25%)
May	945	887	-58 (-6%)
Jun	1,061	1,007	-55 (-5%)
Jul	1,147	1,135	-13 (-1%)
Aug	954	944	-10 (-1%)
Sep	1,052	1,024	-28 (-3%)
Oct	698	666	-32 (-5%)
Nov	881	777	-104 (-12%)
Dec	943	955	13 (1%)
Jan	867	883	17 (2%)
Feb	898	874	-24 (-3%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 103: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration Wet**

Month	Restoration Year Type Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	741	697	-44 (-6%)
Apr	581	467	-114 (-20%)
May	534	429	-105 (-20%)
Jun	467	375	-92 (-20%)
Jul	449	447	-1 (0%)
Aug	444	437	-7 (-2%)
Sep	715	682	-33 (-5%)
Oct	559	538	-22 (-4%)
Nov	844	751	-93 (-11%)
Dec	939	944	5 (1%)
Jan	785	804	18 (2%)
Feb	788	754	-34 (-4%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 104: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration**

Month	Restoration Year Type Normal-Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	939	712	-227 (-24%)
Apr	863	551	-312 (-36%)
May	844	793	-51 (-6%)
Jun	1,028	995	-32 (-3%)
Jul	1,086	1,069	-17 (-2%)
Aug	789	781	-8 (-1%)
Sep	972	942	-31 (-3%)
Oct	621	591	-30 (-5%)
Nov	854	758	-96 (-11%)
Dec	868	873	5 (1%)
Jan	812	835	23 (3%)
Feb	802	786	-16 (-2%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 105: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration**

Month	Restoration Year Type Normal-Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	1,144	751	-393 (-34%)
Apr	952	622	-331 (-35%)
May	1,137	1,082	-54 (-5%)
Jun	1,251	1,195	-56 (-4%)
Jul	1,402	1,387	-14 (-1%)
Aug	1,195	1,181	-13 (-1%)
Sep	1,221	1,193	-28 (-2%)
Oct	784	744	-40 (-5%)
Nov	901	782	-119 (-13%)
Dec	980	1,015	35 (4%)
Jan	927	935	9 (1%)
Feb	975	932	-42 (-4%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 106: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration Dry**

Month	Restoration Year Type Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	1,267	780	-487 (-38%)
Apr	1,021	958	-63 (-6%)
May	1,206	1,166	-40 (-3%)
Jun	1,385	1,313	-72 (-5%)
Jul	1,541	1,520	-21 (-1%)
Aug	1,317	1,298	-19 (-1%)
Sep	1,246	1,220	-25 (-2%)
Oct	827	794	-33 (-4%)
Nov	925	819	-107 (-12%)
Dec	997	997	0 (0%)
Jan	935	958	24 (3%)
Feb	1,057	1,048	-9 (-1%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 107: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration**

Month	Restoration Year Type Critical High Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	1,354	800	-554 (-41%)
Apr	1,268	1,268	1 (0%)
May	1,271	1,273	1 (0%)
Jun	1,477	1,477	0 (0%)
Jul	1,532	1,533	0 (0%)
Aug	1,373	1,373	0 (0%)
Sep	1,235	1,235	0 (0%)
Oct	790	762	-28 (-4%)
Nov	922	828	-94 (-10%)
Dec	994	994	0 (0%)
Jan	919	919	0 (0%)
Feb	1,022	1,000	-22 (-2%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 108: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Restoration**

Month	Restoration Year Type Critical Low Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from
Mar	1,603	1,603	0 (0%)
Apr	957	958	1 (0%)
May	1,006	1,003	-3 (0%)
Jun	1,309	1,309	0 (0%)
Jul	1,476	1,476	0 (0%)
Aug	1,423	1,423	0 (0%)
Sep	1,314	1,314	0 (0%)
Oct	788	753	-35 (-4%)
Nov	963	860	-103 (-11%)
Dec	1,034	1,034	0 (0%)
Jan	1,027	1,027	0 (0%)
Feb	731	910	179 (24%)

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second; TAF = thousand acre-feet

**Table 109: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	All Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	732	714	-19 (-3%)
Nov	773	710	-63 (-8%)
Dec	915	921	5 (1%)
Jan	838	844	6 (1%)
Feb	822	803	-19 (-2%)
Mar	858	688	-170 (-20%)
Apr	609	526	-82 (-14%)
May	665	654	-12 (-2%)
Jun	886	869	-17 (-2%)
Jul	944	943	-1 (0%)
Aug	854	853	-1 (0%)
Sep	819	811	-8 (-1%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 110: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	San Joaquin Valley Index Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	716	697	-19 (-3%)
Nov	763	698	-65 (-9%)
Dec	864	875	11 (1%)
Jan	693	709	17 (2%)
Feb	553	581	28 (5%)
Mar	498	477	-21 (-4%)
Apr	384	356	-29 (-7%)
May	406	386	-20 (-5%)
Jun	445	412	-33 (-7%)
Jul	518	518	0 (0%)
Aug	532	531	-1 (0%)
Sep	610	600	-10 (-2%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 111: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	San Joaquin Valley Index Above Normal Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	701	686	-16 (-2%)
Nov	737	678	-59 (-8%)
Dec	843	853	10 (1%)
Jan	757	763	5 (1%)
Feb	610	608	-2 (0%)
Mar	666	558	-108 (-16%)
Apr	522	433	-90 (-17%)
May	624	611	-12 (-2%)
Jun	895	889	-6 (-1%)
Jul	933	931	-2 (0%)
Aug	748	747	-1 (0%)
Sep	750	741	-9 (-1%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 112: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	San Joaquin Valley Index Below Normal Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	742	724	-19 (-3%)
Nov	773	706	-67 (-9%)
Dec	937	937	0 (0%)
Jan	913	913	0 (0%)
Feb	973	925	-49 (-5%)
Mar	1,023	786	-237 (-23%)
Apr	630	471	-159 (-25%)
May	708	700	-8 (-1%)
Jun	999	986	-13 (-1%)
Jul	1,052	1,050	-2 (0%)
Aug	945	944	-2 (0%)
Sep	894	887	-7 (-1%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 113: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	San Joaquin Valley Index Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	680	657	-23 (-3%)
Nov	765	697	-68 (-9%)
Dec	953	953	0 (0%)
Jan	935	935	0 (0%)
Feb	1,027	971	-56 (-5%)
Mar	1,080	823	-257 (-24%)
Apr	721	575	-146 (-20%)
May	778	767	-12 (-1%)
Jun	1,068	1,057	-11 (-1%)
Jul	1,097	1,097	0 (0%)
Aug	983	981	-1 (0%)
Sep	916	909	-7 (-1%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 114: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - San Joaquin**

Month	San Joaquin Valley Index Critical Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	823	804	-19 (-2%)
Nov	830	772	-57 (-7%)
Dec	1,017	1,017	0 (0%)
Jan	996	996	0 (0%)
Feb	1,147	1,097	-50 (-4%)
Mar	1,274	945	-330 (-26%)
Apr	923	880	-43 (-5%)
May	970	970	0 (0%)
Jun	1,299	1,288	-11 (-1%)
Jul	1,380	1,380	1 (0%)
Aug	1,266	1,264	-1 (0%)
Sep	1,064	1,058	-6 (-1%)

Source: CALSIM II Modeling (Node EC\_630\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 115: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley All Years**

Month	All Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	578	573	-5 (-1%)
Nov	599	570	-29 (-5%)
Dec	755	756	1 (0%)
Jan	728	732	3 (0%)
Feb	726	721	-6 (-1%)
Mar	703	643	-60 (-8%)
Apr	443	418	-25 (-6%)
May	447	442	-5 (-1%)
Jun	567	563	-3 (-1%)
Jul	613	615	1 (0%)
Aug	565	565	0 (0%)
Sep	543	542	-1 (0%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 116: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley Wet**

Month	San Joaquin Valley Index Wet Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	571	565	-5 (-1%)
Nov	593	562	-31 (-5%)
Dec	717	721	5 (1%)
Jan	596	608	12 (2%)
Feb	471	489	18 (4%)
Mar	401	391	-10 (-3%)
Apr	309	300	-9 (-3%)
May	302	297	-5 (-2%)
Jun	385	371	-14 (-4%)
Jul	480	480	0 (0%)
Aug	426	426	0 (0%)
Sep	427	423	-4 (-1%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 117: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley Above Normal**

Month	San Joaquin Valley Index Above Normal Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	560	555	-4 (-1%)
Nov	575	547	-28 (-5%)
Dec	700	703	3 (0%)
Jan	659	660	2 (0%)
Feb	538	537	0 (0%)
Mar	537	490	-46 (-9%)
Apr	392	359	-33 (-8%)
May	383	379	-4 (-1%)
Jun	548	551	4 (1%)
Jul	646	646	1 (0%)
Aug	564	564	0 (0%)
Sep	534	533	-1 (0%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 118: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley Below Normal**

Month	San Joaquin Valley Index Below Normal Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	595	589	-6 (-1%)
Nov	602	572	-31 (-5%)
Dec	777	776	-1 (0%)
Jan	802	801	-1 (0%)
Feb	875	860	-15 (-2%)
Mar	882	760	-122 (-14%)
Apr	452	396	-56 (-12%)
May	465	460	-5 (-1%)
Jun	632	634	2 (0%)
Jul	661	662	1 (0%)
Aug	619	620	1 (0%)
Sep	590	590	0 (0%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 119: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley Dry**

Month	San Joaquin Valley Index Dry Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	539	532	-7 (-1%)
Nov	582	552	-30 (-5%)
Dec	778	775	-3 (0%)
Jan	785	784	-1 (0%)
Feb	905	890	-15 (-2%)
Mar	926	820	-106 (-11%)
Apr	519	474	-45 (-9%)
May	536	535	-1 (0%)
Jun	694	696	2 (0%)
Jul	686	687	1 (0%)
Aug	635	636	1 (0%)
Sep	596	597	1 (0%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 120: Monthly Averages of Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - San Joaquin Valley Critical**

Month	San Joaquin Valley Index Critical Year Summary		
	No-Action Alternative	Proposed Action (umhos/cm)	Change from No Action (umhos/cm)
Oct	625	621	-4 (-1%)
Nov	641	616	-25 (-4%)
Dec	831	828	-3 (0%)
Jan	890	889	-1 (0%)
Feb	1,032	1,001	-32 (-3%)
Mar	995	936	-58 (-6%)
Apr	626	624	-2 (0%)
May	642	634	-8 (-1%)
Jun	702	699	-3 (0%)
Jul	684	687	3 (0%)
Aug	671	672	1 (0%)
Sep	646	649	2 (0%)

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 121: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley All Years**

Month	All Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	885	876	-8 (-1%)
Nov	1,104	1,102	-2 (0%)
Dec	1,419	1,417	-2 (0%)
Jan	1,732	1,723	-9 (-1%)
Feb	1,876	1,872	-4 (0%)
Mar	1,940	1,947	7 (0%)
Apr	1,846	1,868	22 (1%)
May	1,621	1,633	12 (1%)
Jun	1,257	1,257	0 (0%)
Jul	981	977	-4 (0%)
Aug	750	741	-9 (-1%)
Sep	771	761	-9 (-1%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(% indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 122: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley Wet**

Month	Sacramento Valley Index Wet Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	996	977	-19 (-2%)
Nov	1,253	1,241	-12 (-1%)
Dec	1,574	1,559	-15 (-1%)
Jan	1,834	1,812	-22 (-1%)
Feb	1,978	1,962	-16 (-1%)
Mar	2,028	2,028	0 (0%)
Apr	1,998	2,010	12 (1%)
May	1,849	1,844	-4 (0%)
Jun	1,517	1,496	-21 (-1%)
Jul	1,197	1,170	-27 (-2%)
Aug	969	936	-33 (-3%)
Sep	1,025	992	-33 (-3%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(% indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 123: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley Above Normal**

Month	Sacramento Valley Index Above Normal Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	773	763	-10 (-1%)
Nov	1,023	1,014	-9 (-1%)
Dec	1,382	1,380	-2 (0%)
Jan	1,729	1,721	-7 (0%)
Feb	1,921	1,907	-14 (-1%)
Mar	2,010	2,007	-3 (0%)
Apr	1,937	1,958	21 (1%)
May	1,685	1,693	8 (0%)
Jun	1,282	1,268	-13 (-1%)
Jul	887	871	-17 (-2%)
Aug	680	661	-19 (-3%)
Sep	712	694	-18 (-3%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 124: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley Below Normal**

Month	Sacramento Valley Index Below Normal Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	929	911	-18 (-2%)
Nov	1,139	1,121	-17 (-2%)
Dec	1,406	1,387	-19 (-1%)
Jan	1,755	1,730	-25 (-1%)
Feb	1,909	1,885	-24 (-1%)
Mar	1,955	1,950	-5 (0%)
Apr	1,859	1,876	17 (1%)
May	1,604	1,610	7 (0%)
Jun	1,211	1,212	1 (0%)
Jul	942	938	-3 (0%)
Aug	706	706	0 (0%)
Sep	736	733	-3 (0%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 125: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley Dry**

Month	Sacramento Valley Index Dry Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	813	819	6 (1%)
Nov	1,022	1,034	12 (1%)
Dec	1,391	1,405	15 (1%)
Jan	1,723	1,727	4 (0%)
Feb	1,841	1,863	21 (1%)
Mar	1,930	1,953	23 (1%)
Apr	1,761	1,802	41 (2%)
May	1,476	1,513	37 (3%)
Jun	1,075	1,104	30 (3%)
Jul	899	916	17 (2%)
Aug	670	685	15 (2%)
Sep	664	678	14 (2%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

**Table 126: Monthly Averages of Simulated San Luis Storage (TAF) - Sacramento Valley Critical**

Month	Sacramento Valley Index Critical Year Summary		
	No-Action Alternative (TAF)	Proposed Action (TAF)	Change from No Action (TAF)
Oct	811	818	7 (1%)
Nov	948	969	22 (2%)
Dec	1,179	1,199	21 (2%)
Jan	1,500	1,515	15 (1%)
Feb	1,621	1,638	17 (1%)
Mar	1,678	1,698	21 (1%)
Apr	1,539	1,561	22 (1%)
May	1,297	1,319	21 (2%)
Jun	992	1,009	17 (2%)
Jul	775	799	24 (3%)
Aug	516	523	7 (1%)
Sep	481	487	6 (1%)

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

(%) indicates percent change from No-Action Alternative

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet

Table 127: Simulated End-of-Month Millerton Lake storage (TAF) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								226	265	338	421	439
1922	Normal-Wet	404	249	259	524	505	346	301	323	373	439	439	439
1923	Normal-Wet	478	524	523	472	370	237	217	249	294	321	348	343
1924	Critical High	394	430	421	309	198	152	170	164	182	212	245	316
1925	Normal-Dry	341	429	485	449	335	218	201	233	271	305	335	368
1926	Normal-Dry	413	523	524	449	272	153	158	171	229	291	346	439
1927	Normal-Wet	479	492	519	524	438	292	256	286	383	436	439	439
1928	Normal-Dry	478	524	523	438	264	164	165	156	170	191	214	220
1929	Dry	244	261	316	279	214	148	172	168	176	190	213	237
1930	Dry	267	332	311	303	218	148	173	174	189	205	227	240
1931	Critical High	255	302	311	239	165	134	160	157	156	219	290	439
1932	Normal-Wet	479	457	420	471	422	267	224	246	289	316	355	358
1933	Normal-Dry	399	425	335	364	288	194	201	209	225	271	326	349
1934	Dry	435	523	493	365	227	174	182	177	195	237	310	381
1935	Normal-Wet	398	447	483	524	404	262	233	262	313	344	395	439
1936	Normal-Wet	479	520	524	496	375	239	209	227	269	316	363	439
1937	Normal-Wet	479	461	524	524	422	268	229	258	306	428	439	329
1938	Wet	352	329	363	524	524	446	368	351	375	396	439	425
1939	Dry	478	524	509	389	249	153	167	192	207	222	353	439
1940	Normal-Wet	479	502	524	515	369	224	197	216	258	358	439	439
1941	Wet	479	426	479	524	523	386	321	339	384	438	439	439
1942	Normal-Wet	438	459	424	524	501	349	297	321	394	439	412	439
1943	Normal-Wet	479	524	524	491	374	241	213	231	277	310	352	379
1944	Normal-Dry	425	416	444	417	324	222	208	226	293	359	413	439
1945	Normal-Wet	479	456	461	466	404	265	231	289	390	439	439	439
1946	Normal-Wet	478	523	524	494	356	219	199	234	325	422	439	439
1947	Normal-Dry	478	519	523	417	256	159	170	178	198	218	242	247
1948	Normal-Dry	233	284	334	370	279	174	183	210	235	263	293	310
1949	Normal-Dry	329	405	481	464	293	183	188	211	239	268	321	394
1950	Normal-Dry	416	521	523	480	321	191	189	217	377	381	439	439
1951	Normal-Wet	478	524	491	438	324	221	207	218	244	320	439	423
1952	Wet	347	358	473	524	523	420	364	368	394	439	439	439
1953	Normal-Dry	478	501	430	367	318	221	209	214	236	262	303	338
1954	Normal-Dry	393	500	523	468	316	188	169	191	225	268	320	356
1955	Normal-Dry	387	391	391	414	283	193	198	206	225	351	351	439
1956	Wet	479	476	433	524	498	383	342	380	428	439	439	439
1957	Normal-Dry	473	456	428	470	360	235	213	234	267	321	373	362
1958	Wet	291	307	487	524	504	382	345	366	398	424	439	439
1959	Normal-Dry	478	523	500	401	249	139	174	186	196	210	232	269
1960	Dry	305	399	426	358	228	175	186	170	186	225	252	272
1961	Critical High	288	348	341	275	176	154	172	171	180	209	239	403
1962	Normal-Wet	419	471	478	482	397	251	218	247	292	316	367	439
1963	Normal-Wet	478	459	420	455	400	263	234	264	355	410	439	439
1964	Dry	478	484	469	399	255	178	185	178	213	348	439	439
1965	Normal-Wet	462	498	491	456	388	307	277	298	420	439	439	439
1966	Normal-Dry	478	523	523	425	252	147	157	154	185	405	439	439
1967	Wet	339	329	359	524	524	448	372	320	329	351	390	385
1968	Dry	476	523	518	413	271	172	179	181	221	276	351	268
1969	Wet	166	133	393	524	524	448	362	336	358	396	439	439
1970	Normal-Dry	479	494	480	462	332	224	207	213	254	337	417	439
1971	Normal-Dry	466	487	455	418	311	217	209	229	265	332	383	406
1972	Normal-Dry	478	480	471	402	243	149	185	191	224	276	358	439
1973	Normal-Wet	404	380	524	524	399	257	225	263	376	439	439	439
1974	Normal-Wet	479	524	524	524	407	278	246	277	330	376	426	439
1975	Normal-Wet	479	379	372	488	383	237	214	270	335	374	405	416
1976	Critical High	478	496	474	338	197	148	185	185	186	198	216	219
1977	Critical Low	221	242	215	182	142	131	152	151	152	229	387	395
1978	Wet	401	329	347	524	524	438	447	412	429	439	439	439
1979	Normal-Wet	479	506	524	504	359	226	204	237	297	340	380	405
1980	Wet	479	463	511	524	524	423	363	380	414	439	439	439
1981	Normal-Dry	478	523	523	438	264	166	176	180	252	322	439	394
1982	Wet	356	505	524	524	524	463	463	439	432	418	412	308
1983	Wet	370	207	131	524	524	519	465	425	437	407	439	439
1984	Normal-Wet	479	523	523	467	334	224	215	246	318	373	423	439
1985	Normal-Dry	478	523	522	419	255	150	169	181	221	294	388	393
1986	Wet	479	502	489	524	457	317	282	321	362	388	428	439
1987	Dry	478	523	523	411	269	169	174	181	206	235	295	326
1988	Dry	366	422	407	332	233	162	172	171	184	208	235	259
1989	Normal-Dry	328	453	461	376	252	165	175	191	215	237	267	287
1990	Dry	328	421	402	315	213	171	181	169	169	184	201	203
1991	Normal-Dry	258	289	294	312	232	152	179	186	210	237	266	318
1992	Dry	360	452	469	345	241	165	170	173	191	227	412	429
1993	Wet	456	376	460	524	519	374	312	326	358	385	423	439
1994	Dry	478	518	521	430	274	172	180	210	255	308	439	353
1995	Wet	426	351	303	524	524	493	394	311	308	338	404	429
1996	Normal-Wet	479	524	524	524	416	283	253	278	398	429	351	422
1997	Wet	479	524	524	500	362	225	206	232	286	335	439	439
1998	Wet	479	520	353	524	524	457	372	326	348	382	439	439
1999	Normal-Wet	478	511	523	500	355	227	206	226	257	284	366	439
2000	Normal-Wet	479	522	524	509	353	221	201	231	279	308	347	364
2001	Normal-Dry	452	496	523	431	260	162	171	169	192	257	326	364
2002	Normal-Dry	394	507	523	463	306	184	180	179	245	297	364	408
2003	Normal-Wet	434	444	464	506	347	229	207					
Average		418	444	452	446	348	245	230	241	280	324	368	387
Wet		398	383	414	522	506	414	361	352	378	401	430	426
Normal-Wet		463	475	484	496	392	257	228	258	324	374	403	418
Normal-Dry		417	466	467	421	286	181	185	196	235	290	340	369
Dry		391	449	447	362	241	166	177	179	199	239	311	321
Critical High		354	394	387	290	184	147	172	169	176	210	247	344
Critical Low		221	242	215	182	142	131	152	151	152	229	387	395

Source: CALSIM II Modeling (Node S18)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

**Table 128: Simulated End-of-Month Millerton Lake storage (TAF) - Proposed Action**

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								215	233	306	389	439
1922	Normal-Wet	318	179	285	524	489	312	253	263	292	386	439	439
1923	Normal-Wet	439	437	506	458	364	237	214	248	293	321	348	344
1924	Critical High	344	380	376	276	182	145	165	150	149	179	212	270
1925	Normal-Dry	248	308	378	369	289	193	183	208	227	261	292	323
1926	Normal-Dry	322	428	523	452	287	173	176	178	217	279	334	439
1927	Normal-Wet	451	452	523	524	419	257	209	226	302	355	400	407
1928	Normal-Dry	456	479	523	442	278	183	181	162	155	177	200	194
1929	Dry	169	197	276	251	183	148	179	154	136	152	179	192
1930	Dry	174	251	255	263	181	146	179	171	180	199	223	239
1931	Critical High	203	250	264	205	148	131	155	144	131	194	265	408
1932	Normal-Wet	406	381	407	514	450	280	225	235	257	285	323	311
1933	Normal-Dry	305	303	227	283	241	170	183	184	180	227	283	305
1934	Dry	342	429	403	298	195	159	170	160	161	203	276	336
1935	Normal-Wet	299	341	459	523	385	226	185	201	232	262	313	439
1936	Normal-Wet	479	522	523	515	385	240	200	206	228	275	322	439
1937	Normal-Wet	444	387	490	524	404	234	181	198	225	424	439	282
1938	Wet	307	341	347	524	524	430	339	308	311	331	373	343
1939	Dry	399	523	506	389	255	163	174	188	183	199	330	422
1940	Normal-Wet	479	496	523	523	362	204	165	171	193	293	417	439
1941	Wet	479	452	452	524	524	375	300	306	330	425	438	439
1942	Normal-Wet	462	409	380	514	476	304	238	248	301	357	412	439
1943	Normal-Wet	479	524	523	508	383	241	204	210	236	269	311	322
1944	Normal-Dry	329	304	360	348	266	184	187	200	247	315	369	439
1945	Normal-Wet	454	433	504	518	438	281	234	278	359	439	438	439
1946	Normal-Wet	451	471	523	491	353	215	190	214	285	382	439	439
1947	Normal-Dry	465	472	523	418	266	170	178	175	175	196	220	212
1948	Normal-Dry	151	166	228	293	236	159	174	193	199	228	258	265
1949	Normal-Dry	238	285	374	384	251	167	179	195	203	233	286	349
1950	Normal-Dry	324	394	457	434	297	183	184	204	359	381	438	439
1951	Normal-Wet	452	443	435	388	278	188	188	194	200	277	428	439
1952	Wet	320	272	440	524	514	391	318	309	313	359	438	439
1953	Normal-Dry	440	442	393	331	279	191	190	190	192	219	260	293
1954	Normal-Dry	301	379	495	450	317	200	181	193	208	251	304	328
1955	Normal-Dry	311	285	297	344	242	171	182	182	181	351	351	439
1956	Wet	478	506	475	524	493	365	302	314	336	362	403	425
1957	Normal-Dry	418	384	380	426	318	209	201	217	230	285	337	405
1958	Wet	285	259	393	524	499	361	290	281	287	307	358	405
1959	Normal-Dry	474	521	495	399	253	147	178	180	170	184	206	230
1960	Dry	218	307	338	293	196	161	174	166	183	222	249	272
1961	Critical High	236	296	295	242	159	147	167	157	147	177	206	357
1962	Normal-Wet	322	360	427	491	405	256	217	235	260	285	335	439
1963	Normal-Wet	448	405	408	473	410	266	228	246	317	372	414	399
1964	Dry	396	407	400	346	228	168	178	163	177	314	438	439
1965	Normal-Wet	411	364	378	400	335	260	228	240	342	429	438	439
1966	Normal-Dry	477	523	523	424	258	153	159	147	158	377	438	439
1967	Wet	356	283	266	524	524	450	359	285	272	294	332	311
1968	Dry	355	422	450	366	225	169	188	167	179	238	351	331
1969	Wet	246	172	346	524	524	432	333	293	294	331	438	439
1970	Normal-Dry	478	470	474	449	311	208	200	199	221	304	384	415
1971	Normal-Dry	401	404	397	367	263	183	190	204	220	288	339	361
1972	Normal-Dry	413	385	386	338	210	137	178	175	189	242	324	414
1973	Normal-Wet	405	374	457	523	380	221	176	201	294	397	439	439
1974	Normal-Wet	478	433	505	523	387	242	197	215	247	293	343	377
1975	Normal-Wet	403	312	382	523	400	237	201	256	320	358	389	397
1976	Critical High	425	443	427	303	180	141	181	183	188	200	218	223
1977	Critical Low	224	246	218	185	143	131	151	139	131	208	367	393
1978	Wet	386	357	340	524	524	440	433	378	375	396	439	439
1979	Normal-Wet	479	508	523	523	362	215	181	201	241	284	380	405
1980	Wet	479	480	501	524	524	424	342	303	304	325	361	335
1981	Normal-Dry	364	390	449	385	243	166	180	176	228	299	420	420
1982	Wet	391	465	490	524	524	444	428	437	432	418	412	409
1983	Wet	409	217	131	524	524	507	441	387	437	407	439	436
1984	Normal-Wet	478	471	515	461	333	226	213	234	287	341	392	403
1985	Normal-Dry	407	475	522	421	267	165	181	183	203	276	371	393
1986	Wet	479	509	475	524	439	282	235	260	281	307	346	347
1987	Dry	374	446	482	383	236	174	187	171	168	200	264	284
1988	Dry	276	344	355	295	197	160	178	157	144	171	200	214
1989	Normal-Dry	236	339	379	316	203	159	180	176	173	199	231	242
1990	Dry	234	324	310	246	180	155	168	153	134	150	167	158
1991	Normal-Dry	167	177	216	256	183	147	186	171	168	198	231	273
1992	Dry	266	371	414	305	204	163	176	159	151	189	377	439
1993	Wet	479	401	523	524	509	353	281	283	294	322	359	361
1994	Dry	394	433	444	374	244	162	174	196	221	274	438	412
1995	Wet	360	236	279	524	524	481	367	271	247	276	341	434
1996	Normal-Wet	420	399	523	522	396	246	204	216	315	429	351	422
1997	Wet	478	523	522	459	327	195	173	189	223	272	382	439
1998	Wet	402	418	285	524	524	444	345	285	285	319	382	390
1999	Normal-Wet	416	393	448	467	322	208	200	214	225	253	336	412
2000	Normal-Wet	464	491	523	523	353	208	177	195	223	252	291	292
2001	Normal-Dry	334	352	459	386	245	165	178	167	171	236	306	333
2002	Normal-Dry	315	399	443	404	277	175	175	167	213	265	333	367
2003	Normal-Wet	353	312	363	425	282	188	185					
Average		371	382	414	425	332	233	216	215	236	286	341	367
Wet		396	368	392	520	501	398	330	306	314	341	390	399
Normal-Wet		428	412	461	495	382	240	204	223	270	334	381	400
Normal-Dry		349	378	413	380	262	173	182	184	204	261	313	346
Dry		300	371	386	317	210	161	177	167	168	209	291	312
Critical High		302	343	340	257	167	141	167	159	154	187	225	314
Critical Low		224	246	218	185	143	131	151	139	131	208	367	393

Source: CALSIM II Modeling (Node S18)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 129: Simulated Friant-Kern Canal Diversions (cfs) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								81	67	16	16	1,236
1922	Normal-Wet	2,177	3,130	3,664	4,441	3,724	3,261	1,823	637	163	510	1,257	1,521
1923	Normal-Wet	1,057	2,287	3,225	3,234	3,399	2,978	1,667	587	154	100	100	755
1924	Critical High	339	427	603	1,297	1,618	982	579	428	187	16	16	228
1925	Normal-Dry	743	1,503	1,887	2,683	2,821	2,474	1,392	498	139	86	86	651
1926	Normal-Dry	719	1,813	2,982	2,313	2,493	2,195	1,207	438	129	76	76	962
1927	Normal-Wet	1,301	2,909	3,286	4,397	3,360	2,944	1,649	581	153	100	702	1,081
1928	Normal-Dry	1,495	1,745	2,651	2,501	2,695	2,372	1,301	468	134	81	81	465
1929	Dry	484	878	1,215	1,768	1,858	1,684	912	343	112	60	60	326
1930	Dry	489	887	1,227	1,787	1,877	1,701	921	346	113	60	60	329
1931	Critical High	255	323	452	952	1,184	731	441	328	152	16	16	265
1932	Normal-Wet	1,129	3,044	3,439	4,396	3,522	3,085	1,726	606	158	104	104	810
1933	Normal-Dry	725	1,465	1,839	2,616	2,751	2,413	1,359	487	137	84	84	635
1934	Dry	436	589	774	1,689	2,112	1,267	736	542	226	16	16	291
1935	Normal-Wet	868	2,895	3,340	4,219	3,173	2,781	1,560	552	148	95	95	497
1936	Normal-Wet	1,936	1,670	3,356	3,499	3,201	2,805	1,573	556	149	95	95	390
1937	Normal-Wet	508	1,386	1,953	4,189	3,142	2,754	1,545	547	147	1,186	1,294	1,924
1938	Wet	326	797	1,304	4,256	4,477	3,382	2,212	1,511	489	425	433	1,619
1939	Dry	1,364	2,365	1,468	2,137	2,245	2,031	1,092	401	122	70	69	373
1940	Normal-Wet	1,851	2,799	3,207	3,615	2,947	2,584	1,452	517	142	89	694	590
1941	Wet	2,220	3,224	1,947	4,448	4,111	3,380	2,086	850	266	787	1,408	2,087
1942	Normal-Wet	2,159	3,117	3,645	4,439	3,693	3,234	1,808	632	162	265	102	2,049
1943	Normal-Wet	465	1,494	3,399	3,543	3,274	2,869	1,608	568	151	97	97	728
1944	Normal-Dry	783	1,584	1,989	2,830	2,975	2,608	1,465	521	143	90	90	578
1945	Normal-Wet	1,378	3,086	3,551	4,431	3,622	3,172	1,774	625	160	1,300	1,306	1,202
1946	Normal-Wet	1,191	2,552	3,283	2,895	3,044	2,668	1,498	532	145	91	691	1,276
1947	Normal-Dry	1,206	1,372	2,497	2,320	2,500	2,201	1,210	439	129	76	76	417
1948	Normal-Dry	620	1,130	1,568	2,288	2,402	2,173	1,165	425	126	73	73	416
1949	Normal-Dry	693	1,398	1,756	2,495	2,688	2,366	1,298	467	134	81	81	464
1950	Normal-Dry	761	1,540	2,594	2,640	2,776	2,435	1,370	491	133	1,285	1,285	1,841
1951	Normal-Wet	1,004	1,603	1,989	2,828	2,973	2,606	1,464	521	143	90	541	1,862
1952	Wet	720	1,366	1,746	4,450	3,881	3,411	2,105	857	268	228	1,410	1,314
1953	Normal-Dry	850	1,590	1,996	2,840	2,986	2,618	1,471	523	143	90	90	688
1954	Normal-Dry	737	1,490	2,960	2,480	2,673	2,353	1,291	465	133	80	80	461
1955	Normal-Dry	705	1,423	1,788	2,542	2,673	2,345	1,321	475	135	80	70	1,796
1956	Wet	2,216	3,214	3,203	4,449	3,838	3,361	1,877	654	166	412	776	1,454
1957	Normal-Dry	838	1,697	2,131	3,032	3,187	2,793	1,567	554	149	95	95	1,934
1958	Wet	935	1,640	1,898	4,450	3,857	3,377	1,886	657	166	112	721	1,844
1959	Normal-Dry	1,761	1,810	1,550	2,258	2,371	2,145	1,150	420	126	73	73	397
1960	Dry	468	587	836	1,833	2,293	1,371	794	584	240	16	16	314
1961	Critical High	350	441	623	1,345	1,679	1,017	599	443	192	16	16	236
1962	Normal-Wet	913	2,839	3,186	4,180	3,402	2,980	1,669	587	154	101	101	1,983
1963	Normal-Wet	1,313	2,897	3,230	4,106	3,724	3,262	1,823	637	163	109	295	828
1964	Dry	727	1,301	1,633	2,320	2,501	2,202	1,211	439	129	76	76	1,632
1965	Normal-Wet	1,017	2,017	2,777	4,445	3,844	3,366	1,880	655	166	1,063	1,164	1,216
1966	Normal-Dry	1,357	2,635	2,619	2,429	2,617	2,304	1,265	457	132	70	860	1,652
1967	Wet	2,449	1,131	1,580	4,246	4,485	3,677	2,556	1,744	558	491	491	1,812
1968	Dry	599	1,132	1,507	2,196	2,306	2,087	1,120	410	124	71	70	390
1969	Wet	650	541	1,248	3,043	4,483	3,478	2,273	1,553	502	437	1,637	1,976
1970	Normal-Dry	1,798	1,640	2,060	2,929	3,079	2,699	1,515	538	146	92	92	1,016
1971	Normal-Dry	799	1,617	2,030	2,889	3,037	2,662	1,495	531	145	91	91	676
1972	Normal-Dry	1,056	1,333	1,673	2,377	2,561	2,256	1,239	448	130	77	77	741
1973	Normal-Wet	2,055	2,867	1,997	4,157	3,108	2,724	1,529	542	147	666	1,293	1,418
1974	Normal-Wet	2,089	2,935	3,402	4,320	3,279	2,873	1,610	568	151	97	97	1,320
1975	Normal-Wet	1,427	2,953	3,419	4,348	3,309	2,899	1,625	573	152	98	98	735
1976	Critical High	700	578	822	1,799	2,251	1,347	780	574	237	16	16	309
1977	Critical Low	171	218	301	607	751	459	303	228	118	16	16	117
1978	Wet	860	1,159	1,905	4,372	4,489	3,771	2,463	1,681	540	655	1,673	2,237
1979	Normal-Wet	2,053	2,862	3,294	3,822	3,095	2,713	1,523	540	146	93	80	377
1980	Wet	909	2,340	2,928	4,461	4,486	3,566	2,199	894	277	355	911	1,378
1981	Normal-Dry	1,241	1,577	2,435	2,509	2,703	2,379	1,305	470	134	81	141	1,666
1982	Wet	2,321	541	2,952	4,286	4,073	3,415	2,233	2,726	1,694	360	127	811
1983	Wet	91	972	1,505	2,386	4,471	3,917	2,908	1,983	1,829	528	1,760	2,163
1984	Normal-Wet	2,013	2,238	2,927	3,236	3,400	2,979	1,668	587	154	101	101	910
1985	Normal-Dry	902	2,232	2,380	2,400	2,586	2,277	1,250	452	131	78	78	390
1986	Wet	465	3,064	3,572	4,434	3,569	3,126	1,749	613	159	105	105	902
1987	Dry	1,085	1,204	1,525	2,091	2,196	1,988	1,069	394	121	68	68	369
1988	Dry	489	886	1,226	1,784	1,875	1,699	920	345	113	60	60	328
1989	Normal-Dry	537	975	1,350	1,965	2,064	1,869	1,008	374	118	65	65	360
1990	Dry	419	526	746	1,627	2,034	1,221	711	524	220	16	16	281
1991	Normal-Dry	568	1,033	1,432	2,087	2,192	1,984	1,067	393	121	68	68	368
1992	Dry	486	881	1,218	1,769	1,859	1,685	912	343	112	60	60	1,526
1993	Wet	2,204	3,189	3,744	4,448	3,766	3,381	2,087	850	266	208	208	894
1994	Dry	1,210	1,121	1,554	2,265	2,478	2,152	1,154	421	126	73	1,112	1,612
1995	Wet	1,050	2,646	2,054	4,112	4,471	3,922	2,912	1,985	629	560	560	3,270
1996	Normal-Wet	843	2,966	3,437	4,377	3,339	2,926	1,639	578	153	91	91	674
1997	Wet	2,062	2,883	3,323	3,516	3,144	2,756	1,546	548	148	94	175	390
1998	Wet	916	581	1,603	2,613	4,484	3,625	2,692	1,837	586	518	518	2,262
1999	Normal-Wet	1,218	1,682	2,377	3,563	3,142	2,754	1,545	547	147	94	94	898
2000	Normal-Wet	1,713	2,716	3,252	3,619	3,024	2,651	1,489	529	144	91	91	697
2001	Normal-Dry	710	1,434	2,684	2,414	2,601	2,290	1,257	454	131	78	78	449
2002	Normal-Dry	664	1,338	1,913	2,346	2,528	2,226	1,223	443	130	77	77	437
2003	Normal-Wet	793	1,604	2,014	2,864	3,011	2,640	1,483					
Average		1,064	1,751	2,215	3,056	2,998	2,562	1,486	655	223	208	376	994
Wet		1,275	1,830	2,282	3,998	4,130	3,472	2,236	1,309	534	392	807	1,651
Normal-Wet		1,379	2,502	3,066	3,887	3,310	2,900	1,625	575	152	280	441	1,072
Normal-Dry		928	1,557	2,115	2,508	2,665	2,352	1,300	468	134	130	165	811
Dry		688	1,030	1,244	1,939	2,128	1,757	963	424	147	54	240	648
Critical High		411	442	625	1,348	1,683	1,019	600	443	192	16	16	259
Critical Low		171	218	301	607	751	459	303	228	118	16	16	117

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 130: Simulated Friant-Kern Canal Diversions (cfs) - Proposed Action

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								81	67	16	16	790
1922	Normal-Wet	2,544	3,224	3,512	4,622	3,850	3,371	1,883	656	166	112	587	1,361
1923	Normal-Wet	848	1,718	2,157	3,070	3,226	2,827	1,585	560	150	96	96	717
1924	Critical High	296	373	525	1,119	1,395	853	508	377	169	16	16	200
1925	Normal-Dry	626	1,141	1,583	2,309	2,424	2,193	1,175	428	127	74	74	420
1926	Normal-Dry	603	1,097	1,695	2,184	2,294	2,076	1,114	408	124	71	71	573
1927	Normal-Wet	930	1,828	2,516	4,601	3,486	3,054	1,709	600	157	103	103	774
1928	Normal-Dry	663	1,337	1,906	2,346	2,528	2,226	1,223	443	130	77	77	437
1929	Dry	394	496	704	1,532	1,915	1,153	673	497	210	16	16	266
1930	Dry	386	486	690	1,500	1,874	1,129	660	488	207	16	16	261
1931	Critical High	210	267	372	768	954	598	368	275	0	16	16	138
1932	Normal-Wet	946	1,896	2,413	3,436	3,610	3,162	1,768	619	160	106	106	830
1933	Normal-Dry	607	1,106	1,533	2,238	2,349	2,126	1,140	417	125	72	72	407
1934	Dry	334	421	594	1,277	1,593	967	571	423	185	16	16	225
1935	Normal-Wet	871	1,747	2,211	3,861	3,294	2,887	1,618	571	151	98	98	799
1936	Normal-Wet	1,214	1,723	4,407	3,069	3,226	2,827	1,585	560	150	96	96	1,237
1937	Normal-Wet	1,108	2,178	2,826	4,414	3,268	2,863	1,605	567	151	97	1,651	3,918
1938	Wet	873	1,562	2,125	4,405	4,483	3,479	2,274	1,554	502	437	437	1,666
1939	Dry	551	1,162	1,365	1,986	2,086	1,889	1,018	377	118	66	66	351
1940	Normal-Wet	856	1,652	3,758	3,345	3,031	2,657	1,492	530	145	91	91	1,455
1941	Wet	1,625	2,938	2,966	4,460	3,967	3,432	2,118	862	269	211	2,088	2,077
1942	Normal-Wet	995	3,151	3,458	4,313	3,819	3,344	1,868	651	165	111	637	2,344
1943	Normal-Wet	1,095	1,746	4,306	3,135	3,295	2,887	1,618	571	152	98	98	732
1944	Normal-Dry	659	1,328	1,668	2,372	2,556	2,250	1,236	448	130	77	77	1,237
1945	Normal-Wet	981	1,940	2,477	4,141	3,747	3,281	1,834	640	163	996	1,647	980
1946	Normal-Wet	816	1,653	2,935	2,813	2,957	2,593	1,457	519	143	89	141	1,075
1947	Normal-Dry	613	1,116	1,712	2,226	2,338	2,115	1,135	415	125	72	72	391
1948	Normal-Dry	503	912	1,264	1,842	1,936	1,754	948	355	114	62	62	339
1949	Normal-Dry	576	1,047	1,452	2,116	2,222	2,011	1,081	398	122	69	69	386
1950	Normal-Dry	646	1,299	1,630	2,316	2,495	2,198	1,208	439	122	4,607	2,475	2,006
1951	Normal-Wet	681	1,372	1,723	2,448	2,638	2,322	1,274	460	132	79	79	1,437
1952	Wet	1,646	2,235	2,699	4,458	3,917	3,517	2,169	882	274	216	587	1,099
1953	Normal-Dry	699	1,411	1,771	2,519	2,714	2,389	1,310	471	134	81	81	468
1954	Normal-Dry	620	1,130	1,567	2,284	2,398	2,170	1,163	424	126	73	73	415
1955	Normal-Dry	599	1,090	1,512	2,205	2,315	2,095	1,124	411	124	605	381	1,988
1956	Wet	1,766	1,668	3,101	4,450	3,801	3,413	2,106	858	268	210	210	895
1957	Normal-Dry	740	1,495	1,877	2,670	2,807	2,462	1,385	496	139	85	85	648
1958	Wet	1,861	2,118	2,823	4,255	3,819	3,429	2,116	861	269	211	211	900
1959	Normal-Dry	578	1,052	1,456	2,120	2,226	2,015	1,083	398	122	69	69	373
1960	Dry	370	465	660	1,429	1,785	1,078	632	467	200	16	16	249
1961	Critical High	306	386	543	1,163	1,450	885	526	390	173	16	16	207
1962	Normal-Wet	877	1,778	2,233	3,179	3,341	2,928	1,640	578	153	99	99	2,095
1963	Normal-Wet	976	1,981	2,490	3,547	3,727	3,264	1,824	637	163	109	109	827
1964	Dry	557	1,013	1,402	2,043	2,146	1,943	1,046	386	120	67	1,897	2,118
1965	Normal-Wet	967	1,964	2,467	3,514	3,692	3,233	1,807	632	162	108	1,179	997
1966	Normal-Dry	694	1,886	2,488	2,353	2,470	2,235	1,197	435	128	70	544	1,753
1967	Wet	2,841	2,313	2,478	4,394	4,478	3,524	2,618	1,786	571	503	503	1,857
1968	Dry	479	600	855	1,876	2,348	1,403	811	597	245	16	552	886
1969	Wet	1,173	1,151	2,063	4,381	4,489	3,574	2,336	1,595	514	449	1,182	1,754
1970	Normal-Dry	1,157	1,507	1,892	2,690	2,829	2,480	1,396	499	139	86	86	653
1971	Normal-Dry	695	1,402	1,761	2,503	2,697	2,374	1,302	469	134	81	81	449
1972	Normal-Dry	559	1,017	1,408	2,051	2,154	1,950	1,050	387	120	67	67	375
1973	Normal-Wet	880	1,721	3,178	3,995	3,234	2,834	1,589	561	150	96	1,899	1,253
1974	Normal-Wet	1,673	2,965	3,310	4,596	3,405	2,983	1,670	588	154	101	101	783
1975	Normal-Wet	920	1,806	2,293	4,036	3,434	3,009	1,685	592	155	101	101	763
1976	Critical High	415	521	740	1,612	2,015	1,211	705	520	218	16	16	279
1977	Critical Low	173	222	305	617	763	477	307	231	0	16	16	965
1978	Wet	1,485	1,923	2,748	4,395	4,483	3,633	2,525	1,724	552	486	1,275	1,930
1979	Normal-Wet	1,591	1,715	3,980	3,382	3,189	2,795	1,568	554	149	95	627	937
1980	Wet	1,433	2,404	3,041	4,404	4,482	3,460	2,262	1,545	499	434	434	1,657
1981	Normal-Dry	597	1,086	1,505	2,193	2,303	2,084	1,119	410	124	71	71	2,436
1982	Wet	2,769	1,605	4,355	4,407	3,936	3,511	2,295	2,949	2,676	693	319	1,198
1983	Wet	492	1,615	2,191	2,887	4,476	3,998	2,968	2,023	1,178	1,075	2,506	2,111
1984	Normal-Wet	1,221	1,738	2,183	3,105	3,263	2,859	1,603	566	151	97	97	751
1985	Normal-Dry	624	1,137	1,583	2,293	2,407	2,178	1,167	425	126	74	74	1,237
1986	Wet	1,048	3,181	4,339	4,439	3,694	3,235	1,809	632	162	108	108	849
1987	Dry	471	590	840	1,840	2,302	1,376	797	586	241	16	16	305
1988	Dry	389	489	694	1,507	1,883	1,135	663	490	208	16	16	262
1989	Normal-Dry	409	514	730	1,590	1,987	1,195	696	514	216	16	16	275
1990	Dry	316	399	562	1,205	1,503	915	543	402	178	16	16	214
1991	Normal-Dry	440	553	787	1,724	2,156	1,292	750	552	230	16	16	287
1992	Dry	384	483	684	1,483	1,852	1,117	654	482	205	16	16	862
1993	Wet	1,176	3,262	2,990	4,623	3,805	3,416	2,108	858	268	211	211	896
1994	Dry	522	946	1,310	1,907	2,003	1,814	979	365	116	63	740	2,057
1995	Wet	1,975	4,018	2,645	4,392	4,476	3,998	2,968	2,023	641	571	571	2,111
1996	Normal-Wet	1,768	2,917	3,243	4,420	3,465	3,035	1,699	597	156	627	403	1,122
1997	Wet	2,014	1,868	3,988	2,848	2,994	2,624	1,474	524	144	90	90	1,237
1998	Wet	1,541	1,345	2,446	3,940	4,474	3,710	2,755	1,879	598	530	530	2,026
1999	Normal-Wet	735	1,486	1,865	2,652	2,789	2,446	1,377	493	138	85	85	621
2000	Normal-Wet	853	1,684	3,079	3,266	3,094	2,712	1,522	540	146	93	93	713
2001	Normal-Dry	577	1,049	1,455	2,118	2,224	2,013	1,082	398	122	69	69	387
2002	Normal-Dry	553	1,005	1,392	2,026	2,128	1,927	1,037	383	119	67	67	371
2003	Normal-Wet	655	1,320	1,658	2,355	2,538	2,235	1,228					
Average		906	1,477	2,051	2,861	2,869	2,416	1,415	669	235	214	368	999
Wet		1,607	2,200	2,937	4,196	4,111	3,497	2,306	1,410	586	402	704	1,517
Normal-Wet		1,080	1,956	2,827	3,573	3,305	2,896	1,620	577	153	158	426	1,188
Normal-Dry		627	1,155	1,568	2,220	2,373	2,075	1,130	434	134	280	201	763
Dry		429	629	863	1,632	1,941	1,327	754	463	186	29	282	671
Critical High		307	387	545	1,166	1,454	887	527	390	140	16	16	206
Critical Low		173	222	305	617	763	477	307	231	0	16	16	965

Source: CALSIM II Modeling (Node D18A)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 131: Simulated Madera Canal Diversions (cfs) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet	0	0	0	0	0	0	0	0	0	0	0	15
1922	Normal-Wet	0	516	989	1,250	1,250	1,093	411	50	5	4	12	7
1923	Normal-Wet	161	443	855	960	1,121	973	364	47	16	0	0	0
1924	Critical High	0	0	147	418	510	354	52	0	0	0	0	0
1925	Normal-Dry	0	0	340	1,038	1,250	876	142	0	0	0	0	0
1926	Normal-Dry	0	60	527	846	1,028	709	114	0	0	0	0	22
1927	Normal-Wet	169	544	857	1,176	1,105	959	358	41	2	0	6	30
1928	Normal-Dry	229	41	465	944	1,146	790	128	0	0	0	0	0
1929	Dry	0	0	205	604	735	508	79	0	0	0	0	0
1930	Dry	0	0	207	610	743	513	80	0	0	0	0	0
1931	Critical High	0	0	114	312	381	266	37	0	0	0	0	4
1932	Normal-Wet	155	573	903	1,178	1,172	1,017	381	47	16	0	0	0
1933	Normal-Dry	0	0	329	1,003	1,218	839	136	0	0	0	0	0
1934	Dry	0	7	185	538	655	454	70	0	0	0	0	0
1935	Normal-Wet	68	124	885	1,150	1,029	892	332	40	1	0	0	142
1936	Normal-Wet	110	537	922	966	1,040	902	336	34	12	0	0	57
1937	Normal-Wet	78	530	861	1,142	1,016	881	328	40	0	11	27	0
1938	Wet	0	235	1,162	1,250	1,250	1,140	636	70	31	0	0	0
1939	Dry	116	209	244	731	888	613	97	0	0	0	0	31
1940	Normal-Wet	153	508	845	936	936	811	300	36	0	0	6	84
1941	Wet	17	24	1,079	1,250	1,250	1,139	429	35	15	6	58	17
1942	Normal-Wet	198	588	960	1,250	1,242	1,079	405	49	5	1	178	47
1943	Normal-Wet	148	566	934	987	1,070	928	346	42	5	0	0	0
1944	Normal-Dry	110	304	584	810	947	821	304	37	0	0	0	247
1945	Normal-Wet	159	585	935	1,211	1,213	1,053	395	48	5	13	22	25
1946	Normal-Wet	181	472	859	834	976	845	314	38	0	0	6	39
1947	Normal-Dry	84	0	431	850	1,032	712	114	0	0	0	0	0
1948	Normal-Dry	0	0	266	803	975	673	107	0	0	0	0	0
1949	Normal-Dry	0	0	310	941	1,142	787	127	0	0	0	0	0
1950	Normal-Dry	0	0	461	1,016	1,233	850	138	0	16	236	78	68
1951	Normal-Wet	148	307	584	810	947	820	304	37	0	0	4	0
1952	Wet	3	282	1,074	1,250	1,250	1,151	434	59	10	0	30	24
1953	Normal-Dry	122	306	587	814	952	825	305	37	0	0	0	0
1954	Normal-Dry	0	0	518	933	1,133	781	126	0	0	0	0	0
1955	Normal-Dry	0	0	317	965	1,171	807	131	0	0	192	291	24
1956	Wet	298	603	1,011	1,250	1,250	1,163	439	58	16	3	7	57
1957	Normal-Dry	121	334	639	885	1,035	897	334	40	1	0	0	40
1958	Wet	68	7	1,096	1,250	1,250	1,175	443	59	16	0	6	46
1959	Normal-Dry	179	107	262	788	957	660	105	0	0	0	0	0
1960	Dry	0	0	198	583	709	490	76	0	0	0	0	0
1961	Critical High	0	0	151	433	528	366	55	0	0	0	0	0
1962	Normal-Wet	98	537	851	1,126	1,132	982	367	48	16	0	0	101
1963	Normal-Wet	203	558	894	1,169	1,250	1,093	411	43	6	1	2	0
1964	Dry	13	0	281	850	1,032	712	114	0	0	0	77	89
1965	Normal-Wet	157	420	941	1,250	1,250	1,167	440	58	5	10	11	14
1966	Normal-Dry	206	184	456	906	1,100	759	122	0	0	0	8	51
1967	Wet	233	17	1,250	1,250	1,250	1,250	842	262	15	11	9	55
1968	Dry	0	7	252	756	919	634	101	0	0	0	184	0
1969	Wet	7	325	1,177	1,250	1,250	1,179	659	70	19	0	39	13
1970	Normal-Dry	137	319	611	847	990	858	319	39	0	0	0	29
1971	Normal-Dry	114	313	600	832	973	843	313	38	0	0	0	0
1972	Normal-Dry	63	0	291	879	1,068	736	118	0	0	0	0	12
1973	Normal-Wet	65	517	858	1,128	1,002	869	323	33	1	7	84	29
1974	Normal-Wet	260	523	867	1,171	1,072	930	347	42	5	0	0	24
1975	Normal-Wet	64	549	873	1,128	1,084	941	351	42	7	0	0	0
1976	Critical High	38	0	195	572	696	482	75	0	0	0	0	0
1977	Critical Low	0	0	81	206	253	49	156	0	0	0	0	40
1978	Wet	0	10	1,250	1,250	1,250	1,250	764	177	10	2	22	5
1979	Normal-Wet	45	525	873	999	997	864	321	39	0	0	223	162
1980	Wet	81	731	1,080	1,250	1,250	1,215	459	59	21	1	7	40
1981	Normal-Dry	82	18	428	948	1,150	793	128	0	0	0	0	40
1982	Wet	10	65	1,199	1,250	1,250	1,153	644	242	100	218	248	0
1983	Wet	0	45	1,250	1,250	1,250	1,250	1,013	203	117	239	79	49
1984	Normal-Wet	284	435	807	961	1,122	974	364	47	5	0	0	19
1985	Normal-Dry	28	127	414	891	1,082	746	120	0	0	0	0	167
1986	Wet	109	512	931	1,250	1,191	1,034	388	47	16	0	0	11
1987	Dry	80	24	253	712	866	598	95	0	0	0	0	0
1988	Dry	0	0	206	610	741	513	80	0	0	0	0	0
1989	Normal-Dry	0	0	225	670	814	563	88	0	0	0	0	0
1990	Dry	0	0	178	519	632	438	67	0	0	0	0	0
1991	Normal-Dry	0	0	238	710	863	596	94	0	0	0	0	0
1992	Dry	0	0	205	605	735	508	79	0	0	0	0	40
1993	Wet	68	549	1,011	1,250	1,250	1,178	445	66	10	0	0	0
1994	Dry	95	0	263	791	961	663	106	0	0	0	11	40
1995	Wet	0	334	1,250	1,250	1,250	1,250	1,143	434	27	10	8	62
1996	Normal-Wet	202	533	919	1,153	1,097	952	355	39	2	191	715	66
1997	Wet	329	544	976	957	1,017	882	328	40	0	0	0	139
1998	Wet	11	96	1,250	1,250	1,250	1,250	958	204	56	43	43	65
1999	Normal-Wet	186	330	678	965	1,016	881	328	40	0	0	0	2
2000	Normal-Wet	40	498	840	951	968	839	311	8	10	4	3	3
2001	Normal-Dry	0	0	467	898	1,091	752	121	0	0	0	0	0
2002	Normal-Dry	0	0	331	863	1,048	723	116	0	0	0	0	0
2003	Normal-Wet	112	310	594	823	962	834	309					
Average		79	229	645	943	1,026	839	294	40	8	15	31	29
Wet		77	274	1,128	1,232	1,232	1,166	626	130	30	33	35	36
Normal-Wet		138	481	855	1,067	1,083	943	352	41	5	10	54	36
Normal-Dry		61	88	421	878	1,058	766	161	8	1	18	16	29
Dry		25	21	223	659	801	554	87	0	0	0	23	17
Critical High		10	0	152	434	529	367	55	0	0	0	0	1
Critical Low		0	0	81	206	253	49	156	0	0	0	0	40

Source: CALSIM II Modeling (Node D18B)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 132: Simulated Madera Canal Diversions (cfs) - Proposed Action

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet												
1922	Normal-Wet	0	516	981	1,250	1,250	1,171	442	59	5	0	0	0
1923	Normal-Wet	123	340	649	899	1,050	911	339	41	7	0	0	0
1924	Critical High	0	0	130	363	444	308	45	0	0	0	0	0
1925	Normal-Dry	0	0	270	813	988	681	109	0	0	0	0	0
1926	Normal-Dry	0	0	284	750	912	629	100	0	0	0	0	5
1927	Normal-Wet	130	370	746	1,250	1,157	1,004	376	44	6	0	0	0
1928	Normal-Dry	0	0	330	863	1,048	723	116	0	0	0	0	0
1929	Dry	0	0	169	490	597	414	63	0	0	0	0	0
1930	Dry	0	0	166	480	585	405	61	0	0	0	0	0
1931	Critical High	0	0	96	256	313	143	107	0	0	0	0	0
1932	Normal-Wet	136	388	748	1,036	1,210	1,050	394	48	16	0	0	0
1933	Normal-Dry	0	0	258	777	944	652	104	0	0	0	0	0
1934	Dry	0	0	145	412	502	349	52	0	0	0	0	0
1935	Normal-Wet	68	124	715	1,106	1,078	935	349	42	1	0	0	207
1936	Normal-Wet	126	351	877	899	1,050	911	339	35	12	0	0	386
1937	Normal-Wet	240	541	882	1,151	1,067	926	345	42	5	0	0	375
1938	Wet	231	235	1,193	1,250	1,250	1,179	659	70	31	0	0	0
1939	Dry	0	27	228	677	823	568	89	0	0	0	0	0
1940	Normal-Wet	116	322	820	907	970	841	312	38	0	0	0	439
1941	Wet	155	24	1,060	1,250	1,250	1,160	437	35	15	0	0	0
1942	Normal-Wet	83	594	955	1,236	1,250	1,177	444	61	5	0	429	11
1943	Normal-Wet	490	545	893	923	1,079	936	349	42	5	0	0	0
1944	Normal-Dry	0	0	289	877	1,064	734	118	0	0	0	0	485
1945	Normal-Wet	117	402	777	1,186	1,250	1,119	421	54	5	0	0	14
1946	Normal-Wet	117	322	761	804	940	815	301	36	0	0	0	29
1947	Normal-Dry	0	0	289	771	937	647	103	0	0	0	0	0
1948	Normal-Dry	0	0	212	629	765	529	83	0	0	0	0	0
1949	Normal-Dry	0	0	241	720	875	604	96	0	0	0	0	0
1950	Normal-Dry	0	0	281	848	1,029	710	114	0	0	0	0	40
1951	Normal-Wet	0	0	302	916	1,112	767	124	0	0	0	0	0
1952	Wet	381	480	1,084	1,250	1,250	1,250	499	82	10	0	0	12
1953	Normal-Dry	0	0	313	953	1,157	797	129	0	0	0	0	0
1954	Normal-Dry	0	0	266	801	972	671	107	0	0	0	0	0
1955	Normal-Dry	0	0	253	760	924	638	101	0	0	462	452	0
1956	Wet	235	433	1,004	1,250	1,250	1,201	453	68	21	0	0	0
1957	Normal-Dry	0	0	338	1,031	1,250	863	140	0	0	0	0	0
1958	Wet	446	204	1,081	1,250	1,250	1,250	651	162	21	0	0	0
1959	Normal-Dry	0	0	241	721	877	605	96	0	0	0	0	0
1960	Dry	0	0	159	459	559	387	58	0	0	0	0	0
1961	Critical High	0	0	134	377	460	320	47	0	0	0	0	0
1962	Normal-Wet	94	359	683	947	1,106	960	359	44	7	0	0	39
1963	Normal-Wet	149	410	777	1,076	1,250	1,095	412	44	6	1	1	2
1964	Dry	0	0	233	696	846	584	92	0	0	0	0	40
1965	Normal-Wet	147	405	768	1,064	1,242	1,078	405	49	5	0	0	4
1966	Normal-Dry	0	81	428	835	1,015	700	112	0	0	0	0	39
1967	Wet	233	135	1,250	1,250	1,250	1,250	895	390	15	11	9	55
1968	Dry	0	0	202	596	725	501	78	0	0	0	462	215
1969	Wet	7	325	1,208	1,250	1,250	1,218	681	70	19	0	0	1
1970	Normal-Dry	37	0	341	1,042	1,250	883	144	0	0	0	0	0
1971	Normal-Dry	0	0	311	945	1,147	791	128	0	0	0	0	0
1972	Normal-Dry	0	0	234	698	849	586	93	0	0	0	0	0
1973	Normal-Wet	26	349	856	1,076	1,054	914	341	35	3	1	1	15
1974	Normal-Wet	195	555	867	1,196	1,124	975	365	47	8	0	0	0
1975	Normal-Wet	53	370	714	1,118	1,136	986	369	47	16	0	0	0
1976	Critical High	0	0	177	515	627	434	66	0	0	0	0	0
1977	Critical Low	0	0	82	209	257	49	159	0	0	0	0	415
1978	Wet	231	10	1,250	1,250	1,250	1,250	817	257	15	11	37	116
1979	Normal-Wet	122	339	853	944	1,035	898	334	40	1	0	501	548
1980	Wet	249	747	1,107	1,250	1,250	1,171	654	117	21	0	0	0
1981	Normal-Dry	0	0	252	755	917	633	101	0	0	0	0	40
1982	Wet	10	449	1,250	1,250	1,250	1,250	708	183	35	547	394	0
1983	Wet	0	45	1,250	1,250	1,250	1,250	1,013	203	446	577	112	36
1984	Normal-Wet	186	345	659	912	1,066	924	345	42	1	0	0	0
1985	Normal-Dry	0	0	269	805	978	675	108	0	0	0	0	543
1986	Wet	329	517	960	1,250	1,243	1,079	406	49	16	0	0	0
1987	Dry	0	0	199	585	712	492	76	0	0	0	0	0
1988	Dry	0	0	167	483	588	407	62	0	0	0	0	0
1989	Normal-Dry	0	0	175	508	619	428	65	0	0	0	0	0
1990	Dry	0	0	138	390	476	330	48	0	0	0	0	0
1991	Normal-Dry	0	0	187	549	668	462	71	0	0	0	0	0
1992	Dry	0	0	165	475	579	401	61	0	0	0	0	18
1993	Wet	152	548	986	1,250	1,250	1,203	454	68	10	0	0	0
1994	Dry	0	0	219	650	791	546	86	0	0	0	0	40
1995	Wet	378	531	1,250	1,250	1,250	1,250	1,190	434	29	11	9	23
1996	Normal-Wet	516	519	864	1,171	1,148	997	373	41	6	418	876	105
1997	Wet	267	367	864	817	955	828	307	37	0	0	0	445
1998	Wet	231	96	1,250	1,250	1,250	1,250	1,010	204	58	45	36	58
1999	Normal-Wet	0	0	335	1,022	1,240	855	139	0	0	0	0	0
2000	Normal-Wet	23	339	811	906	996	864	321	8	10	4	3	3
2001	Normal-Dry	0	0	241	721	876	605	96	0	0	0	0	0
2002	Normal-Dry	0	0	232	690	839	579	91	0	0	0	0	0
2003	Normal-Wet	0	0	287	868	1,054	727	117					
Average		83	171	561	883	980	797	281	42	11	26	41	59
Wet		221	322	1,128	1,223	1,231	1,190	677	152	47	75	37	47
Normal-Wet		130	352	743	1,034	1,117	953	337	39	5	18	75	91
Normal-Dry		2	3	272	786	954	659	105	0	0	19	19	48
Dry		0	2	183	533	648	449	69	0	0	0	38	26
Critical High		0	0	134	378	461	301	66	0	0	0	0	0
Critical Low		0	0	82	209	257	49	159	0	0	0	0	415

Source: CALSIM II Modeling (Node D18B)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 133: Simulated Merced River Inflow To San Joaquin River (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	292	368	486	482	879	748	28	1,251	3,357	1,387	867	453
1923	Above Normal	469	304	962	1,270	1,017	261	305	586	582	159	762	598
1924	Critical	593	385	382	396	320	273	272	201	29	51	36	49
1925	Below Normal	282	419	425	428	689	421	922	533	214	116	77	54
1926	Dry	266	354	375	375	336	271	514	401	61	51	37	51
1927	Above Normal	274	322	313	381	441	280	589	267	166	136	84	89
1928	Below Normal	426	352	389	361	493	341	898	426	271	179	88	80
1929	Critical	296	387	387	408	435	328	654	113	129	49	54	92
1930	Critical	276	367	359	361	375	303	558	244	31	35	35	93
1931	Critical	276	385	372	382	408	292	86	98	82	86	40	75
1932	Above Normal	266	363	475	469	691	383	432	20	94	109	57	58
1933	Dry	310	386	383	426	371	337	512	214	78	60	41	30
1934	Critical	298	383	405	466	469	311	437	231	113	84	35	29
1935	Above Normal	282	389	409	580	428	587	698	364	230	182	100	55
1936	Above Normal	368	410	385	428	2,906	665	811	1,468	132	134	820	441
1937	Wet	707	424	417	416	4,208	1,251	311	2,281	562	597	812	446
1938	Wet	442	401	2,035	1,341	4,928	4,767	1,521	3,341	4,530	2,238	1,159	596
1939	Dry	833	397	383	443	509	453	849	488	135	67	73	68
1940	Above Normal	331	424	418	573	489	280	419	1,409	236	145	240	416
1941	Wet	459	427	1,286	1,340	3,119	1,858	842	3,103	2,347	1,749	1,069	508
1942	Wet	718	447	1,183	1,528	1,720	517	522	1,180	2,978	1,651	1,021	509
1943	Wet	494	549	783	2,172	1,974	3,163	910	1,070	435	510	941	490
1944	Below Normal	475	459	436	414	532	345	926	320	391	172	136	88
1945	Above Normal	357	489	446	441	2,769	834	677	561	170	934	937	421
1946	Above Normal	840	640	1,862	1,067	829	469	689	597	303	170	129	81
1947	Dry	592	532	963	621	869	323	205	122	147	65	80	76
1948	Below Normal	319	397	398	388	299	313	594	125	197	182	100	97
1949	Below Normal	348	404	386	402	394	359	518	218	263	121	121	70
1950	Below Normal	326	394	394	428	403	390	650	321	329	162	130	77
1951	Above Normal	329	402	2,100	1,733	1,641	454	703	213	308	186	116	63
1952	Wet	347	417	460	1,941	1,317	1,922	1,245	3,703	3,081	1,943	1,231	621
1953	Below Normal	450	428	334	1,080	727	358	729	537	190	140	126	55
1954	Below Normal	360	405	403	406	439	277	423	252	277	167	131	81
1955	Dry	314	392	409	537	442	338	358	327	146	120	113	55
1956	Wet	311	386	133	3,245	1,983	498	793	1,195	2,336	1,954	1,152	610
1957	Below Normal	580	422	409	411	406	364	694	520	332	195	154	81
1958	Wet	424	381	405	481	721	1,286	2,986	3,555	2,730	1,720	1,123	675
1959	Dry	483	395	382	395	564	335	875	547	172	107	116	94
1960	Critical	307	374	383	397	451	343	635	325	164	101	127	49
1961	Critical	286	365	387	372	395	321	166	200	143	70	55	40
1962	Below Normal	264	341	359	360	681	975	755	346	446	253	182	78
1963	Above Normal	346	362	376	376	410	467	882	758	454	277	194	158
1964	Dry	411	397	398	404	316	320	569	292	197	163	114	77
1965	Wet	346	356	528	1,780	497	355	527	773	444	285	1,448	634
1966	Below Normal	474	866	812	1,055	724	346	885	611	257	206	165	79
1967	Wet	293	366	400	408	424	746	1,756	2,666	4,147	4,063	1,494	797
1968	Dry	747	411	330	382	500	358	936	605	249	196	177	130
1969	Wet	275	431	434	903	4,093	1,534	2,098	5,555	4,141	2,433	1,233	711
1970	Above Normal	825	320	444	2,940	1,265	917	986	657	329	256	222	150
1971	Below Normal	383	375	359	425	384	331	907	661	314	256	188	102
1972	Dry	359	386	423	270	340	263	726	472	281	240	222	18
1973	Above Normal	309	412	432	474	889	652	373	1,106	476	600	1,038	574
1974	Wet	815	776	1,095	1,690	870	1,126	666	1,563	594	841	1,054	586
1975	Wet	667	350	409	307	2,026	1,073	793	680	2,074	1,163	1,062	533
1976	Critical	1,107	357	362	392	370	291	502	477	255	175	205	136
1977	Critical	354	311	322	373	253	234	531	311	173	106	81	44
1978	Wet	268	282	350	516	824	582	219	566	4,016	2,613	1,294	1,369
1979	Above Normal	509	579	441	1,541	1,932	1,485	901	973	355	262	731	443
1980	Wet	698	374	392	3,976	4,525	1,490	621	961	1,997	2,284	1,248	583
1981	Dry	629	398	444	479	452	479	945	596	240	168	168	97
1982	Wet	401	405	414	484	1,795	2,297	4,921	3,385	1,922	2,249	1,390	1,170
1983	Wet	1,344	1,754	2,298	3,657	4,416	6,069	1,408	2,947	7,343	5,943	2,444	1,100
1984	Above Normal	1,196	1,802	3,551	1,903	1,596	512	782	591	328	291	277	217
1985	Dry	537	338	334	488	759	371	607	382	274	236	206	100
1986	Wet	405	395	408	380	3,446	4,143	921	1,748	1,415	946	1,113	737
1987	Critical	558	416	418	381	380	393	508	354	183	130	135	87
1988	Critical	356	340	375	377	305	246	297	300	201	97	92	52
1989	Critical	256	274	322	304	310	339	165	41	142	68	62	67
1990	Critical	305	303	327	310	346	205	110	181	146	72	68	26
1991	Critical	248	258	274	292	205	359	200	168	146	91	54	10
1992	Critical	270	289	297	291	352	298	201	139	139	76	55	11
1993	Wet	206	313	350	684	449	438	18	63	1,693	1,492	1,085	640
1994	Critical	739	369	334	315	381	186	337	131	142	43	54	2
1995	Wet	239	327	317	611	386	3,584	1,035	3,031	5,130	4,891	1,700	509
1996	Wet	474	379	365	844	3,009	1,633	817	1,696	290	374	903	480
1997	Wet	613	845	3,494	9,912	2,144	1,191	782	686	240	149	114	84
1998	Wet	369	336	356	1,396	5,205	2,115	1,235	1,064	5,045	4,614	1,499	759
1999	Above Normal	741	382	296	820	2,026	362	765	779	292	174	196	100
2000	Above Normal	285	345	318	325	2,186	1,137	807	851	242	175	112	59
2001	Dry	668	496	392	389	391	365	617	394	244	74	84	25
2002	Dry	239	403	390	449	307	249	517	219	172	90	61	2
2003	Below Normal	227	316	353	327	287	241	568	449	160	80	66	41
Average		453	437	595	900	1,157	834	746	892	924	701	473	271
Wet		484	479	783	1,687	2,290	1,849	1,124	2,003	2,619	2,004	1,186	650
Above Normal		483	497	827	958	1,345	609	676	700	294	262	376	245
Below Normal		378	429	420	499	497	389	728	409	280	172	128	76
Dry		491	407	431	435	473	343	633	389	184	126	115	63
Critical		408	348	357	363	360	295	354	220	139	83	74	54

Source: CALSIM II Modeling (Node C566)  
Notes:  
Simulation Period: WY 1922 -2003  
Year type as defined by the San Joaquin Valley Index Year Type  
Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 134: Simulated Merced River Inflow To San Joaquin River (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	292	368	486	482	879	748	28	1,251	3,357	1,387	867	453
1923	Above Normal	469	304	962	1,270	1,017	261	209	679	582	159	762	598
1924	Critical	593	385	382	396	320	273	265	195	29	54	36	49
1925	Below Normal	282	419	425	428	689	421	813	602	214	116	77	54
1926	Dry	266	354	375	375	336	271	476	373	61	51	37	51
1927	Above Normal	274	322	313	381	441	280	169	439	166	136	84	89
1928	Below Normal	426	352	389	361	493	341	867	456	271	179	88	80
1929	Critical	296	387	387	408	435	328	618	148	129	49	54	92
1930	Critical	276	367	359	361	375	303	558	168	31	35	35	93
1931	Critical	276	385	372	382	408	292	89	98	82	86	41	75
1932	Above Normal	266	363	475	469	691	383	456	106	94	109	57	58
1933	Dry	310	386	383	426	371	337	469	256	78	60	41	30
1934	Critical	298	383	405	466	469	311	389	279	113	78	29	29
1935	Above Normal	282	389	409	580	428	587	344	515	230	182	100	55
1936	Above Normal	368	410	385	428	3,123	665	811	1,312	132	289	820	441
1937	Wet	707	424	417	416	4,208	1,251	311	2,281	562	597	812	446
1938	Wet	442	401	2,035	1,341	4,928	4,767	1,521	3,341	4,530	2,238	1,159	596
1939	Dry	833	397	383	443	509	453	849	488	135	67	73	68
1940	Above Normal	331	424	418	573	489	280	419	1,387	236	145	262	416
1941	Wet	459	427	1,286	1,340	3,119	1,858	842	3,103	2,347	1,749	1,069	508
1942	Wet	718	447	1,183	1,528	1,720	517	522	1,180	2,978	1,651	1,021	509
1943	Wet	494	549	783	2,172	1,974	3,163	910	1,154	435	427	941	490
1944	Below Normal	475	459	436	414	532	345	895	350	391	172	136	88
1945	Above Normal	357	489	446	441	2,769	834	450	565	392	934	937	421
1946	Above Normal	840	640	1,862	1,067	829	469	483	490	303	170	129	267
1947	Dry	713	532	963	621	869	323	622	290	147	65	80	76
1948	Below Normal	319	397	398	388	299	313	514	203	197	182	100	97
1949	Below Normal	348	404	386	402	394	359	479	190	263	121	121	70
1950	Below Normal	326	394	394	428	403	390	650	187	329	162	130	77
1951	Above Normal	329	402	1,777	1,733	1,641	454	282	486	308	186	116	63
1952	Wet	347	417	460	2,071	1,317	1,922	1,245	3,703	3,081	1,943	1,231	621
1953	Below Normal	450	428	334	1,080	727	358	698	567	190	140	126	55
1954	Below Normal	360	405	403	406	439	277	392	252	277	167	131	81
1955	Dry	314	392	409	537	442	338	303	285	146	120	113	55
1956	Wet	311	386	133	3,365	1,983	498	582	1,354	2,383	1,954	1,152	610
1957	Below Normal	580	422	409	411	406	364	674	501	332	195	154	81
1958	Wet	424	381	405	481	721	1,322	2,986	3,555	2,730	1,720	1,123	675
1959	Dry	483	395	382	395	564	335	875	547	172	107	116	94
1960	Critical	307	374	383	397	451	343	635	273	164	101	127	49
1961	Critical	286	365	387	372	395	321	166	200	143	70	55	40
1962	Below Normal	264	341	359	360	681	975	788	640	446	253	182	78
1963	Above Normal	346	362	376	376	410	467	540	787	454	277	194	158
1964	Dry	411	397	398	404	316	320	533	327	197	163	114	77
1965	Wet	346	356	528	1,780	497	355	527	751	444	291	1,448	634
1966	Below Normal	474	866	812	1,055	724	346	885	611	257	206	165	79
1967	Wet	293	366	400	408	424	746	1,756	2,666	4,147	4,063	1,494	797
1968	Dry	747	411	330	382	500	358	927	614	249	196	177	130
1969	Wet	275	431	434	903	4,093	1,534	2,098	5,555	4,141	2,433	1,233	711
1970	Above Normal	825	320	444	2,940	1,265	917	986	657	329	256	222	150
1971	Below Normal	383	375	359	425	384	331	876	690	314	256	188	102
1972	Dry	359	386	423	270	340	263	726	374	281	240	222	18
1973	Above Normal	309	412	432	474	889	652	435	1,326	286	600	1,038	574
1974	Wet	815	776	1,095	1,690	870	1,126	325	2,091	390	841	1,054	586
1975	Wet	667	350	409	307	2,026	1,073	423	776	2,343	1,163	1,062	533
1976	Critical	1,107	357	362	392	370	291	509	483	255	175	205	136
1977	Critical	354	311	322	373	253	234	528	313	173	106	81	44
1978	Wet	268	282	350	516	824	582	219	566	4,016	2,613	1,294	1,369
1979	Above Normal	509	579	441	1,541	1,932	1,485	531	1,330	355	262	731	443
1980	Wet	698	374	392	3,976	4,525	1,490	752	617	2,222	2,284	1,248	583
1981	Dry	629	398	444	479	452	479	945	596	240	168	168	97
1982	Wet	401	405	414	484	1,795	2,297	4,921	3,385	1,922	2,249	1,390	1,170
1983	Wet	1,344	1,754	2,298	3,657	4,416	6,069	1,408	2,947	7,343	5,943	2,444	1,100
1984	Above Normal	1,196	1,802	3,551	1,903	1,596	512	362	748	328	291	277	217
1985	Dry	779	338	334	488	759	371	577	412	274	236	206	100
1986	Wet	405	395	408	380	3,446	4,143	921	1,748	1,415	946	1,113	737
1987	Critical	558	416	418	381	380	393	476	385	183	130	135	87
1988	Critical	356	340	375	377	305	246	264	279	201	97	92	52
1989	Critical	256	274	322	304	310	339	165	41	142	68	62	67
1990	Critical	305	303	327	310	346	205	110	181	146	72	68	26
1991	Critical	248	258	274	292	205	359	200	168	146	91	54	10
1992	Critical	270	289	297	291	352	298	201	139	139	76	55	11
1993	Wet	206	313	350	684	449	438	44	63	1,667	1,492	1,085	640
1994	Critical	739	369	334	315	381	186	293	131	142	41	54	2
1995	Wet	239	327	317	611	386	3,626	1,035	3,031	5,130	4,891	1,700	509
1996	Wet	474	379	365	844	3,009	1,633	673	1,834	290	374	903	480
1997	Wet	613	845	3,494	9,912	2,144	1,191	589	385	240	149	157	512
1998	Wet	389	336	356	1,396	5,205	2,115	1,235	1,064	5,045	4,614	1,499	759
1999	Above Normal	741	382	296	820	2,026	362	554	682	292	174	196	100
2000	Above Normal	285	345	318	325	2,500	1,137	614	923	242	175	112	150
2001	Dry	692	496	392	389	391	365	617	394	244	74	84	25
2002	Dry	239	403	390	449	307	249	517	219	172	90	61	2
2003	Below Normal	227	316	353	327	287	241	568	664	160	80	66	41
	Average	458	437	591	903	1,163	835	689	920	929	702	474	279
	Wet	484	479	783	1,698	2,290	1,853	1,078	2,017	2,631	2,001	1,188	668
	Above Normal	483	497	807	958	1,378	609	478	777	296	272	377	262
	Below Normal	378	429	420	499	497	389	700	455	280	172	128	76
	Dry	521	407	431	435	473	343	649	398	184	126	115	63
	Critical	408	348	357	363	360	295	342	218	139	83	74	54

Source: CALSIM II Modeling (Node C566)  
Notes:  
Simulation Period: WY 1922 -2003  
Year type as defined by the San Joaquin Valley Index Year Type  
Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 135: Simulated San Joaquin River Below Merced River (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	441	841	1,434	1,138	3,788	2,374	1,797	1,978	3,581	1,478	953	909
1923	Above Normal	652	1,099	2,081	2,428	2,095	793	1,355	1,116	873	282	848	1,116
1924	Critical	767	850	820	727	864	473	304	221	0	0	26	345
1925	Below Normal	416	837	779	703	1,822	1,037	1,534	1,013	466	156	145	508
1926	Dry	440	815	813	706	1,165	601	1,260	749	164	71	103	505
1927	Above Normal	432	1,094	914	826	2,722	1,167	1,363	760	411	208	168	543
1928	Below Normal	670	1,237	941	887	1,364	1,263	1,511	716	375	201	155	535
1929	Critical	444	891	826	740	1,103	758	812	389	263	67	94	534
1930	Critical	424	786	748	773	1,098	817	624	427	85	9	52	533
1931	Critical	425	872	777	713	998	418	0	99	33	0	0	356
1932	Above Normal	363	730	1,597	1,249	3,461	1,062	799	451	319	138	72	366
1933	Dry	407	718	721	783	930	754	685	451	234	40	56	337
1934	Critical	404	701	760	773	1,145	614	422	258	69	0	0	329
1935	Above Normal	397	806	813	1,538	1,337	1,696	2,292	1,139	605	287	185	509
1936	Above Normal	569	914	807	889	9,014	1,641	1,839	2,010	435	205	903	905
1937	Wet	908	949	904	1,584	11,086	4,312	3,527	5,510	918	699	895	917
1938	Wet	616	1,102	3,701	3,049	14,961	16,487	9,581	11,997	10,574	2,494	1,296	1,095
1939	Dry	1,074	1,163	870	839	1,284	1,078	1,276	841	254	103	139	603
1940	Above Normal	537	891	840	2,199	2,655	1,559	1,090	1,867	425	200	307	871
1941	Wet	634	900	2,363	2,314	9,321	4,162	2,379	4,218	2,808	1,922	1,189	998
1942	Wet	911	1,137	2,205	3,243	3,230	1,583	1,318	1,761	3,302	1,791	1,108	965
1943	Wet	669	1,352	1,287	6,336	3,257	8,338	2,283	1,721	624	566	1,025	945
1944	Below Normal	650	1,115	858	778	1,486	1,177	1,318	668	561	210	202	542
1945	Above Normal	542	1,127	933	821	7,211	2,628	1,383	982	433	1,005	1,005	885
1946	Above Normal	1,051	1,222	2,609	1,512	1,512	1,142	1,213	963	457	207	195	535
1947	Dry	775	1,155	1,580	1,001	1,566	591	302	274	240	85	146	530
1948	Below Normal	514	874	804	686	801	699	1,229	546	387	240	169	552
1949	Below Normal	524	839	792	717	1,007	1,125	668	512	416	157	187	524
1950	Below Normal	475	870	800	873	1,427	843	958	627	448	198	196	568
1951	Above Normal	524	1,730	7,180	4,046	2,702	1,202	964	572	429	225	184	518
1952	Wet	524	921	1,256	4,311	2,505	6,640	3,846	9,015	5,948	2,097	1,318	1,103
1953	Below Normal	615	1,137	935	1,851	1,430	696	1,019	835	392	196	201	510
1954	Below Normal	518	893	825	803	1,168	926	722	535	421	206	198	535
1955	Dry	463	869	863	1,015	1,120	726	557	667	282	157	178	518
1956	Wet	459	867	6,318	9,938	4,810	1,649	1,288	1,682	2,526	2,012	1,222	1,084
1957	Below Normal	754	1,015	831	743	1,056	777	938	981	503	235	222	545
1958	Wet	627	849	860	910	2,019	5,167	7,789	5,198	4,470	1,847	1,229	1,157
1959	Dry	649	849	805	759	1,488	712	1,083	756	242	128	183	640
1960	Critical	456	812	789	728	1,242	655	762	556	225	99	164	497
1961	Critical	434	869	825	703	982	607	159	268	157	38	65	468
1962	Below Normal	413	811	781	691	3,752	2,056	1,026	664	634	307	248	532
1963	Above Normal	530	814	781	919	1,878	1,159	1,976	1,408	693	366	279	631
1964	Dry	631	1,126	869	800	897	606	724	578	329	199	179	531
1965	Wet	549	944	1,747	4,054	1,414	968	1,615	1,214	666	357	1,558	1,105
1966	Below Normal	639	1,868	1,478	1,646	1,569	793	1,139	882	344	244	232	533
1967	Wet	441	870	1,552	1,146	1,413	2,458	7,848	7,280	7,791	6,072	1,599	1,271
1968	Dry	912	914	785	746	1,178	779	1,133	865	335	218	250	585
1969	Wet	452	935	1,002	7,797	17,836	11,821	12,326	14,836	13,575	3,068	1,337	1,203
1970	Above Normal	1,050	1,057	931	5,725	2,290	2,016	1,297	960	484	295	290	604
1971	Below Normal	551	896	1,042	968	1,070	814	1,164	1,005	485	295	256	556
1972	Dry	517	882	943	634	973	489	821	694	368	261	288	482
1973	Above Normal	476	986	886	1,115	3,407	2,473	1,024	1,469	649	641	1,106	1,029
1974	Wet	1,053	1,393	1,696	3,269	1,643	2,299	1,681	1,991	757	908	1,123	1,041
1975	Wet	856	954	864	687	3,339	2,415	1,620	1,272	2,330	1,234	1,149	987
1976	Critical	1,313	980	801	706	941	524	548	547	303	194	271	625
1977	Critical	512	795	727	688	735	291	418	311	118	13	36	338
1978	Wet	374	631	802	1,981	6,663	6,737	9,051	6,688	5,530	2,708	1,384	1,896
1979	Above Normal	658	1,100	879	2,392	3,478	3,201	1,507	1,304	511	325	799	898
1980	Wet	890	876	830	9,166	11,920	7,771	2,654	1,607	2,204	2,377	1,317	1,038
1981	Dry	778	984	882	941	1,112	1,081	1,218	825	311	207	235	552
1982	Wet	609	942	917	1,840	4,951	5,454	13,598	9,286	3,402	2,359	1,495	1,743
1983	Wet	1,610	4,924	10,966	14,189	19,664	22,239	13,414	13,418	17,752	11,034	2,572	1,674
1984	Above Normal	1,822	5,312	10,011	6,007	2,569	1,158	985	857	431	329	360	670
1985	Dry	748	893	805	851	1,495	970	814	512	367	257	272	554
1986	Wet	597	915	911	792	12,140	13,219	5,124	5,147	2,445	987	1,182	1,201
1987	Critical	742	1,012	840	712	1,057	929	539	413	249	149	175	530
1988	Critical	525	817	797	740	853	484	406	356	218	67	106	483
1989	Critical	404	744	744	619	895	818	168	79	161	42	78	595
1990	Critical	490	764	732	641	905	436	82	279	158	54	77	454
1991	Critical	414	697	664	590	717	1,336	290	199	138	25	44	296
1992	Critical	408	625	619	550	1,268	769	252	126	79	26	21	296
1993	Wet	322	649	721	3,068	2,106	1,803	579	400	1,945	1,598	1,187	1,096
1994	Critical	930	1,008	772	629	1,064	319	379	288	148	0	66	310
1995	Wet	355	711	655	2,422	3,193	9,783	6,502	10,075	7,425	9,183	1,789	1,000
1996	Wet	623	999	836	1,403	5,084	3,625	1,357	2,956	429	465	1,005	953
1997	Wet	807	1,977	10,307	32,109	8,811	1,825	1,146	904	327	187	181	538
1998	Wet	534	907	810	2,649	13,765	5,713	7,780	8,454	11,995	9,062	1,589	1,249
1999	Above Normal	934	1,133	784	1,347	3,101	919	1,256	1,134	430	212	280	588
2000	Above Normal	466	810	724	851	4,899	2,471	1,339	1,230	384	200	197	531
2001	Dry	964	964	814	769	1,182	1,118	882	633	314	111	167	488
2002	Dry	397	890	991	975	1,007	809	602	438	241	127	143	455
2003	Below Normal	375	836	922	739	952	657	834	752	281	151	163	496
Average		632	1,062	1,506	2,283	3,334	2,543	2,114	2,069	1,623	941	537	720
Wet		661	1,148	2,289	4,975	7,038	6,202	5,004	5,359	4,722	2,771	1,279	1,132
Above Normal		688	1,302	2,048	2,116	3,396	1,643	1,355	1,139	498	320	449	700
Below Normal		547	1,017	907	930	1,454	989	1,081	749	440	215	198	533
Dry		673	940	903	832	1,184	793	874	637	283	151	180	521
Critical		568	826	765	690	992	640	385	301	150	49	80	437

Source: CALSIM II Modeling (Node C620)

Notes:

Simulation Period: WY 1922 - 2003

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 136: Simulated San Joaquin River Below Merced River (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	513	1,059	1,434	1,138	3,932	3,106	2,023	1,917	3,624	1,484	960	933
1923	Above Normal	725	1,317	2,078	2,363	2,244	1,525	2,485	1,252	916	288	854	1,140
1924	Critical	767	850	820	727	864	1,205	297	215	0	0	26	345
1925	Below Normal	489	1,055	779	703	1,962	1,769	2,100	1,088	510	162	151	533
1926	Dry	512	1,033	813	706	1,305	1,333	1,898	764	207	77	109	529
1927	Above Normal	504	1,312	914	826	2,857	1,899	2,164	935	455	214	174	568
1928	Below Normal	743	1,455	941	887	1,495	1,995	2,154	789	419	207	161	559
1929	Critical	517	1,109	826	740	1,243	1,490	859	466	307	73	100	558
1930	Critical	497	1,004	748	773	1,238	1,549	731	394	156	43	81	567
1931	Critical	425	872	777	713	998	1,150	0	99	32	0	0	355
1932	Above Normal	436	946	1,597	1,249	3,591	1,794	2,052	656	362	144	78	390
1933	Dry	479	936	721	783	1,070	1,486	1,321	533	278	46	62	361
1934	Critical	476	919	760	773	1,285	1,346	455	314	112	0	0	354
1935	Above Normal	470	1,024	813	1,538	1,477	2,428	3,147	1,299	648	293	191	534
1936	Above Normal	642	1,132	807	889	7,708	2,373	2,814	1,897	478	366	909	929
1937	Wet	980	1,167	904	1,584	9,182	4,583	3,393	4,045	961	705	901	941
1938	Wet	688	1,320	3,700	2,910	13,509	15,792	7,958	11,608	10,189	2,500	1,302	1,119
1939	Dry	1,147	1,381	870	839	1,424	1,810	1,358	885	298	109	145	628
1940	Above Normal	610	1,109	840	2,199	2,765	2,291	2,316	1,888	470	207	336	895
1941	Wet	706	1,119	2,363	2,306	7,755	4,896	3,560	5,774	4,488	1,929	1,195	1,022
1942	Wet	983	1,355	2,199	2,585	3,360	2,315	2,544	1,804	3,346	1,798	1,114	989
1943	Wet	741	1,570	1,287	4,133	3,397	7,377	2,799	1,631	668	490	1,032	970
1944	Below Normal	722	1,326	858	778	1,618	1,909	1,962	741	605	216	208	566
1945	Above Normal	615	1,345	933	821	5,467	3,356	2,303	1,023	698	1,012	1,011	909
1946	Above Normal	1,123	1,440	2,609	1,512	1,652	1,874	2,137	931	501	213	201	745
1947	Dry	969	1,373	1,580	1,001	1,706	1,323	1,425	567	283	92	152	554
1948	Below Normal	587	1,092	804	686	932	1,431	1,825	591	431	246	176	577
1949	Below Normal	597	1,057	792	717	1,147	1,857	1,304	528	460	164	194	549
1950	Below Normal	548	1,088	800	873	1,567	1,575	1,587	581	492	204	202	592
1951	Above Normal	596	1,948	3,620	3,147	2,842	1,934	1,770	812	473	231	190	542
1952	Wet	596	1,139	1,256	4,550	2,648	6,628	4,516	7,302	5,431	2,103	1,324	1,127
1953	Below Normal	688	1,355	935	1,851	1,570	1,428	1,663	902	435	202	207	534
1954	Below Normal	591	1,111	825	803	1,308	1,658	1,366	578	464	212	204	560
1955	Dry	536	1,087	863	1,015	1,260	1,458	1,178	668	325	163	184	543
1956	Wet	532	1,085	4,780	9,592	4,626	2,176	2,224	3,109	3,836	2,018	1,228	1,109
1957	Below Normal	827	1,234	831	743	1,196	1,509	1,594	1,006	547	241	228	569
1958	Wet	699	1,067	860	910	2,159	5,291	9,179	6,102	4,261	1,853	1,235	1,182
1959	Dry	721	1,067	805	759	1,628	1,444	1,758	799	285	134	189	664
1960	Critical	528	1,030	789	728	1,374	1,387	843	546	268	105	170	521
1961	Critical	434	869	825	703	982	1,339	159	268	157	39	65	468
1962	Below Normal	485	1,029	781	691	3,892	2,788	2,285	1,036	678	313	255	557
1963	Above Normal	602	1,032	781	919	1,956	1,891	2,783	1,477	737	372	285	655
1964	Dry	703	1,344	869	800	1,028	1,338	770	601	373	206	185	555
1965	Wet	621	1,162	1,747	3,401	1,554	1,701	2,841	1,235	710	371	1,565	1,130
1966	Below Normal	712	2,086	1,478	1,646	1,709	1,525	1,791	947	387	250	238	557
1967	Wet	514	1,088	1,552	1,146	1,553	2,864	8,211	7,175	6,156	6,079	1,605	1,295
1968	Dry	985	1,133	785	746	1,309	1,511	1,206	917	379	224	256	609
1969	Wet	524	1,153	1,002	6,332	16,093	11,065	12,398	15,369	11,553	3,062	1,343	1,227
1970	Above Normal	1,123	1,275	931	5,362	2,443	2,772	1,955	1,019	527	300	295	629
1971	Below Normal	623	1,114	1,042	968	1,210	1,546	1,808	1,079	529	302	263	581
1972	Dry	589	1,100	943	634	1,105	1,221	1,496	639	411	268	294	506
1973	Above Normal	548	1,204	886	1,115	3,544	3,205	2,312	1,809	502	646	1,112	1,053
1974	Wet	1,125	1,611	1,696	2,525	1,783	3,031	2,566	2,486	596	914	1,129	1,066
1975	Wet	929	1,172	864	687	3,479	3,217	2,398	1,431	2,643	1,240	1,155	1,012
1976	Critical	1,313	983	801	706	941	1,256	555	553	303	194	271	625
1977	Critical	512	795	727	688	735	291	416	313	118	13	36	338
1978	Wet	447	773	802	1,981	5,189	6,109	7,647	6,424	6,930	2,714	1,390	1,920
1979	Above Normal	730	1,318	879	2,392	3,598	3,855	2,286	1,704	555	331	805	922
1980	Wet	963	1,094	830	7,395	10,964	7,147	2,432	2,263	4,029	2,383	1,323	1,062
1981	Dry	850	1,202	882	941	1,252	1,813	1,893	868	354	213	242	576
1982	Wet	682	1,160	917	1,840	3,818	5,836	13,431	7,816	4,052	2,365	1,501	1,767
1983	Wet	1,683	3,960	10,359	13,845	17,573	22,800	13,271	12,925	17,277	11,029	2,579	1,698
1984	Above Normal	1,908	4,963	9,109	5,412	2,700	1,890	1,791	1,023	474	335	366	695
1985	Dry	1,062	1,111	805	851	1,635	1,702	1,458	585	410	264	278	578
1986	Wet	670	1,133	911	792	10,682	12,475	4,890	4,734	2,993	993	1,188	1,225
1987	Critical	814	1,230	840	712	1,197	1,661	588	488	292	155	182	555
1988	Critical	597	1,035	797	740	985	1,216	455	378	261	73	112	507
1989	Critical	477	962	744	619	1,035	1,550	843	122	205	48	85	619
1990	Critical	562	982	732	641	1,045	1,168	163	322	202	60	83	478
1991	Critical	487	915	664	590	857	2,068	968	242	182	31	50	321
1992	Critical	481	843	619	550	1,400	1,501	333	169	122	32	27	320
1993	Wet	395	867	721	3,068	2,246	2,535	1,831	1,669	3,950	1,604	1,193	1,120
1994	Critical	1,002	1,226	772	629	1,204	1,051	416	331	191	0	72	334
1995	Wet	428	929	655	2,412	2,084	10,531	5,797	8,115	7,674	9,193	1,795	1,024
1996	Wet	696	1,217	836	1,403	5,216	3,874	2,440	2,239	473	471	1,011	977
1997	Wet	880	2,130	8,140	31,627	8,388	2,557	2,069	1,888	1,590	193	230	991
1998	Wet	627	1,118	810	2,624	11,582	6,082	7,465	7,133	9,671	9,071	1,595	1,273
1999	Above Normal	1,007	1,351	784	1,347	3,241	1,651	2,193	1,092	474	219	286	612
2000	Above Normal	538	1,028	724	851	5,472	3,287	2,258	1,400	428	206	204	646
2001	Dry	1,061	1,182	814	769	1,322	1,850	1,539	695	357	117	173	512
2002	Dry	470	1,108	991	975	1,147	1,541	1,278	473	284	133	149	480
2003	Below Normal	448	1,054	922	739	1,092	1,389	2,051	1,080	325	158	169	520
Average		705	1,243	1,399	2,154	3,190	3,115	2,619	2,092	1,698	948	544	752
Wet		734	1,310	2,109	4,616	6,365	6,416	5,328	5,258	4,879	2,773	1,287	1,174
Above Normal		761	1,484	1,769	1,996	3,347	2,377	2,298	1,263	544	336	456	742
Below Normal		620	1,235	907	930	1,592	1,721	1,807	842	483	221	204	558
Dry		776	1,158	903	832	1,322	1,525	1,429	682	327	157	186	546
Critical		618	976	765	690	1,086	1,327	505	326	182	54	85	454

Source: CALSIM II Modeling (Node C620)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the San Joaquin Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 137: Simulated San Joaquin River Below Tuolumne River (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	1,277	1,471	2,032	1,742	4,474	3,007	5,193	3,753	12,155	3,448	1,807	1,591
1923	Above Normal	1,489	1,695	2,905	4,407	4,054	1,658	4,443	2,718	1,535	913	1,500	1,810
1924	Critical	1,616	1,483	1,401	1,307	1,498	1,046	807	717	296	285	358	713
1925	Below Normal	868	1,279	1,220	1,130	2,276	1,539	3,271	2,743	992	583	615	1,017
1926	Dry	1,102	1,342	1,290	1,171	1,651	1,095	2,261	1,842	596	489	566	1,007
1927	Above Normal	1,025	1,543	1,366	1,283	3,241	1,717	3,105	2,544	1,165	819	821	1,228
1928	Below Normal	1,524	1,853	1,554	1,489	2,015	4,157	3,345	1,983	833	634	629	1,047
1929	Critical	1,107	1,387	1,304	1,209	1,602	1,249	1,554	1,193	575	349	424	911
1930	Critical	903	1,277	1,186	1,209	1,601	1,279	1,359	1,288	415	312	398	922
1931	Critical	903	1,325	1,227	1,150	1,465	869	512	616	333	289	336	726
1932	Above Normal	808	1,167	2,027	1,676	3,987	1,556	2,306	1,961	1,058	753	714	1,041
1933	Dry	1,256	1,374	1,313	1,366	1,543	1,375	1,657	1,414	699	459	520	847
1934	Critical	1,000	1,197	1,212	1,207	1,606	1,073	932	764	371	287	334	703
1935	Above Normal	855	1,252	1,250	1,974	1,806	2,125	3,936	2,901	1,357	893	826	1,195
1936	Above Normal	1,420	1,523	1,404	1,482	9,689	5,183	5,207	3,546	1,150	863	1,548	1,588
1937	Wet	1,757	1,597	1,504	2,174	14,869	8,815	7,070	7,076	1,603	1,298	1,538	1,602
1938	Wet	1,463	1,748	5,623	4,662	22,073	24,307	15,116	17,518	15,045	6,242	1,959	1,798
1939	Dry	2,125	1,840	1,474	1,434	2,189	2,500	2,544	2,018	696	534	614	1,121
1940	Above Normal	1,134	1,388	1,280	2,633	3,175	5,108	4,980	3,080	1,222	878	905	1,501
1941	Wet	1,390	1,453	3,119	3,583	14,334	9,089	6,985	5,528	4,140	4,526	1,895	1,649
1942	Wet	1,718	1,739	2,853	6,522	6,666	4,337	5,597	6,224	5,965	5,139	1,929	1,772
1943	Wet	1,600	1,994	1,914	9,759	6,514	14,571	6,102	3,318	2,681	1,700	1,616	1,486
1944	Below Normal	1,520	1,726	1,485	1,429	2,251	2,187	3,176	2,148	1,098	670	686	1,000
1945	Above Normal	1,186	1,581	1,322	1,350	9,336	6,598	4,065	2,661	1,027	1,749	1,724	1,560
1946	Above Normal	1,854	1,689	6,370	4,216	4,534	4,347	3,541	2,912	1,289	893	876	1,216
1947	Dry	1,552	1,733	2,256	1,617	2,201	1,198	1,166	1,095	648	454	577	975
1948	Below Normal	1,112	1,328	1,203	1,080	1,242	1,149	2,277	1,708	1,103	783	661	999
1949	Below Normal	1,161	1,334	1,204	1,237	1,524	1,894	1,587	1,500	850	560	627	968
1950	Below Normal	1,115	1,372	1,263	1,559	1,856	1,392	2,513	2,104	1,054	638	652	1,040
1951	Above Normal	1,155	1,937	11,452	7,806	6,421	4,099	3,563	2,440	847	703	669	991
1952	Wet	1,103	1,322	1,732	5,158	3,151	10,482	8,548	14,187	10,416	5,902	2,028	1,801
1953	Below Normal	1,413	1,645	1,453	2,586	2,708	1,351	3,233	2,777	787	770	723	1,013
1954	Below Normal	1,095	1,293	1,216	1,201	1,580	1,409	1,907	1,687	916	633	662	1,007
1955	Dry	1,047	1,255	1,284	1,718	1,487	1,231	1,496	1,557	695	539	608	959
1956	Wet	969	1,267	6,760	16,878	8,978	4,848	3,804	3,245	5,893	5,003	1,990	1,763
1957	Below Normal	1,568	1,521	1,322	1,261	1,637	1,508	3,168	3,033	948	687	713	1,053
1958	Wet	1,235	1,255	1,292	1,472	2,865	8,668	13,996	10,194	9,609	4,635	1,993	1,910
1959	Dry	1,519	1,396	1,386	1,383	2,454	2,034	2,407	1,895	652	524	596	1,114
1960	Critical	1,032	1,202	1,097	1,091	1,789	1,090	1,445	1,341	465	335	456	840
1961	Critical	766	1,199	1,107	1,040	1,358	1,006	617	699	368	244	324	723
1962	Below Normal	733	1,126	1,104	1,005	4,694	2,598	3,058	2,565	1,054	715	725	1,041
1963	Above Normal	1,109	1,114	1,097	1,344	2,372	1,438	3,621	2,884	1,231	946	863	1,249
1964	Dry	1,298	1,508	1,269	1,319	1,418	1,123	1,516	1,301	659	501	525	911
1965	Wet	1,010	1,210	1,981	7,032	4,957	4,036	4,846	2,778	1,079	953	2,223	1,925
1966	Below Normal	1,340	2,361	3,588	2,751	3,612	1,915	2,403	1,972	647	543	558	878
1967	Wet	946	1,138	1,871	1,729	1,700	3,708	12,461	11,289	14,337	12,654	2,280	2,051
1968	Dry	1,674	1,365	1,271	1,263	1,691	1,699	2,396	2,102	736	621	676	1,017
1969	Wet	968	1,303	1,291	8,907	23,293	15,767	17,525	21,726	21,171	6,944	1,888	1,819
1970	Above Normal	2,386	1,820	2,079	11,721	4,876	5,122	3,148	2,628	834	782	735	1,133
1971	Below Normal	1,341	1,400	1,574	1,492	1,528	1,909	3,060	2,835	904	680	689	1,017
1972	Dry	1,148	1,232	1,467	1,001	1,346	864	1,781	1,687	704	590	658	868
1973	Above Normal	907	1,439	1,409	1,640	4,235	3,068	2,677	2,837	1,726	1,179	1,700	1,644
1974	Wet	1,734	2,139	3,723	6,134	3,399	6,139	4,396	3,767	3,850	2,021	1,685	1,802
1975	Wet	2,044	2,070	1,653	1,330	5,784	6,105	4,168	3,239	4,816	2,551	1,803	1,711
1976	Critical	2,784	1,819	1,385	1,250	1,485	1,083	1,156	1,074	518	394	556	930
1977	Critical	817	1,105	1,050	984	1,064	577	776	708	247	136	194	511
1978	Wet	613	901	1,053	2,413	7,213	7,317	10,586	8,190	8,638	3,187	1,922	2,443
1979	Above Normal	1,168	1,812	1,491	3,439	7,136	7,507	3,813	6,888	1,054	930	1,508	1,516
1980	Wet	1,617	1,690	1,708	12,350	18,682	11,604	5,134	3,803	7,326	5,947	1,972	1,839
1981	Dry	1,637	1,786	1,402	1,634	1,723	1,892	2,602	2,005	680	583	669	995
1982	Wet	1,167	1,364	1,518	2,401	11,630	11,078	22,902	15,755	8,304	6,103	2,179	4,223
1983	Wet	4,906	8,077	16,306	19,471	26,390	38,367	18,586	21,409	22,135	17,364	5,531	3,867
1984	Above Normal	2,882	10,799	17,489	10,177	5,980	4,312	2,744	2,725	1,080	938	1,040	1,371
1985	Dry	1,609	1,868	1,236	1,341	2,106	1,658	1,771	1,614	831	651	723	1,015
1986	Wet	1,049	1,279	1,268	1,077	14,568	21,277	8,131	8,492	6,184	1,689	1,808	1,966
1987	Critical	2,028	2,339	1,407	1,309	1,610	1,662	1,157	1,006	485	368	438	801
1988	Critical	790	1,103	1,051	1,045	1,120	780	880	803	355	196	287	675
1989	Critical	619	964	990	863	1,166	1,175	726	632	310	192	279	839
1990	Critical	729	1,037	965	877	1,209	706	494	789	304	203	286	680
1991	Critical	649	962	887	798	977	1,810	777	774	265	166	243	500
1992	Critical	643	891	837	774	1,753	1,104	641	558	216	156	192	489
1993	Wet	559	885	938	3,849	2,588	2,110	1,803	1,840	6,079	3,710	1,597	1,601
1994	Critical	1,627	1,484	1,186	1,029	1,556	727	919	817	323	161	273	518
1995	Wet	610	930	879	2,941	3,347	17,773	11,311	19,695	12,600	17,588	3,661	1,897
1996	Wet	1,499	1,477	1,267	1,942	10,753	8,547	4,256	5,717	3,563	1,317	1,576	1,589
1997	Wet	1,518	2,503	16,602	49,845	12,531	4,653	2,950	2,482	861	740	751	1,127
1998	Wet	1,343	1,244	1,242	3,550	20,689	10,824	11,741	14,125	19,069	15,863	2,199	1,915
1999	Above Normal	2,016	1,640	1,480	3,356	8,103	4,621	3,524	2,742	981	764	866	1,196
2000	Above Normal	1,172	1,280	1,068	1,285	8,509	6,223	3,899	3,035	1,755	744	975	1,355
2001	Dry	1,661	1,458	1,232	1,288	1,584	2,543	1,890	1,614	685	448	558	888
2002	Dry	834	1,133	1,375	1,403	1,250	1,165	1,309	1,352	564	452	548	851
2003	Below Normal	805	1,084	1,216	1,004	1,194	981	1,998	2,062	576	431	534	866
Average		1,326	1,648	2,336	3,549	5,031	4,679	4,223	4,003	3,089	2,079	1,080	1,289
Wet		1,421	1,752	3,339	7,372	10,477	10,726	8,884	8,973	8,647	5,689	2,068	1,965
Above Normal		1,411	2,105	3,468	3,737	5,466	4,043	3,661	3,031	1,207	922	1,079	1,350
Below Normal		1,200	1,486	1,493	1,479	2,163	1,845	2,692	2,240	905	641	652	996
Dry		1,420	1,484	1,404	1,380	1,742	1,567	1,907	1,654	680	526	603	967
Critical		1,126	1,298	1,143	1,071	1,429	1,077	922	861	365	255	336	717

Source: CALSIM II Modeling (Node C630)  
 Notes:  
 Simulation Period: WY 1922 - 2003  
 Year type as defined by the San Joaquin Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 138: Simulated San Joaquin River Below Tuolumne River (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	1,350	1,689	2,032	1,742	4,617	3,739	5,419	3,692	12,198	3,454	1,613	1,615
1923	Above Normal	1,562	1,913	2,902	4,342	4,202	2,390	5,572	2,740	1,577	918	1,505	1,834
1924	Critical	1,616	1,483	1,401	1,307	1,497	1,778	800	711	296	285	358	713
1925	Below Normal	940	1,497	1,220	1,130	2,416	2,272	3,791	2,819	1,036	590	621	1,041
1926	Dry	1,175	1,560	1,290	1,171	1,791	1,827	2,851	1,858	640	495	572	1,031
1927	Above Normal	1,098	1,761	1,366	1,283	3,377	2,449	3,738	2,569	1,209	825	827	1,253
1928	Below Normal	1,596	2,071	1,554	1,489	2,146	5,198	3,944	2,057	877	641	635	1,071
1929	Critical	1,180	1,605	1,304	1,209	1,742	1,982	1,600	1,213	618	356	430	936
1930	Critical	975	1,495	1,186	1,209	1,741	2,011	1,466	1,254	486	346	427	956
1931	Critical	903	1,325	1,227	1,150	1,465	1,601	512	615	333	289	336	725
1932	Above Normal	881	1,383	2,027	1,676	4,117	2,288	3,559	2,299	1,102	759	720	1,065
1933	Dry	1,329	1,592	1,313	1,366	1,683	2,107	2,244	1,496	742	465	526	871
1934	Critical	1,072	1,415	1,212	1,207	1,746	1,805	965	820	414	287	334	727
1935	Above Normal	927	1,470	1,250	1,974	1,946	2,857	4,790	2,986	1,401	899	833	1,219
1936	Above Normal	1,492	1,741	1,404	1,482	8,383	6,061	6,182	3,433	1,194	1,024	1,554	1,613
1937	Wet	1,830	1,815	1,504	2,174	12,965	9,086	6,936	5,611	1,647	1,304	1,544	1,626
1938	Wet	1,535	1,966	5,623	4,523	20,621	23,611	13,493	17,130	14,659	6,249	1,966	1,822
1939	Dry	2,197	2,058	1,474	1,434	2,329	3,232	2,593	2,093	739	540	621	1,145
1940	Above Normal	1,207	1,606	1,280	2,633	3,285	5,839	6,206	3,103	1,269	889	937	1,527
1941	Wet	1,463	1,671	3,119	3,574	12,768	9,823	8,166	7,084	5,820	4,533	1,901	1,673
1942	Wet	1,791	1,957	2,847	5,864	6,795	5,069	6,823	6,270	6,013	5,150	1,939	1,798
1943	Wet	1,673	2,213	1,914	7,556	6,655	13,610	6,618	3,229	2,725	1,624	1,622	1,511
1944	Below Normal	1,593	1,937	1,485	1,429	2,383	2,920	3,774	2,221	1,142	676	692	1,025
1945	Above Normal	1,259	1,799	1,322	1,350	7,635	7,327	4,666	2,700	1,293	1,756	1,731	1,585
1946	Above Normal	1,927	1,907	6,601	4,216	4,674	5,080	4,143	2,932	1,333	900	883	1,426
1947	Dry	1,746	1,951	2,256	1,617	2,341	1,930	2,342	1,638	692	460	583	999
1948	Below Normal	1,184	1,546	1,203	1,080	1,374	1,881	2,826	1,706	1,147	791	669	1,024
1949	Below Normal	1,234	1,552	1,204	1,237	1,665	2,626	2,180	1,518	897	571	637	994
1950	Below Normal	1,189	1,590	1,264	1,560	1,996	2,124	3,138	2,025	1,097	644	658	1,064
1951	Above Normal	1,228	2,155	7,990	6,907	6,561	4,831	4,319	2,468	891	709	675	1,015
1952	Wet	1,176	1,540	1,732	5,397	3,463	10,469	9,217	12,474	9,899	5,908	2,034	1,825
1953	Below Normal	1,485	1,863	1,453	2,586	2,848	2,083	3,869	2,800	831	777	730	1,038
1954	Below Normal	1,168	1,511	1,216	1,201	1,721	2,141	2,543	1,730	960	640	669	1,031
1955	Dry	1,119	1,473	1,284	1,718	1,627	1,963	2,070	1,558	738	545	614	983
1956	Wet	1,041	1,485	5,221	16,571	8,794	5,374	4,404	4,640	7,469	5,009	1,996	1,788
1957	Below Normal	1,641	1,739	1,322	1,261	1,777	2,144	3,767	3,055	992	693	720	1,077
1958	Wet	1,308	1,473	1,292	1,472	3,005	8,841	15,385	11,098	9,400	4,642	1,999	1,935
1959	Dry	1,592	1,614	1,386	1,383	2,594	2,766	3,005	1,967	695	529	601	1,138
1960	Critical	1,104	1,420	1,097	1,091	1,920	1,822	1,527	1,331	509	342	462	864
1961	Critical	766	1,199	1,107	1,040	1,358	1,738	617	699	369	245	325	723
1962	Below Normal	806	1,344	1,104	1,005	4,834	3,330	4,317	3,125	1,098	722	732	1,066
1963	Above Normal	1,182	1,332	1,097	1,344	2,451	2,170	4,340	2,869	1,273	950	868	1,273
1964	Dry	1,370	1,726	1,269	1,319	1,549	1,855	1,561	1,324	703	508	532	935
1965	Wet	1,082	1,428	1,981	6,427	5,097	4,768	6,072	2,801	1,126	970	2,232	1,951
1966	Below Normal	1,413	2,579	3,588	2,752	3,752	2,647	3,003	2,044	691	550	565	902
1967	Wet	1,018	1,356	1,871	1,729	1,840	4,148	12,825	11,185	12,702	12,661	2,287	2,075
1968	Dry	1,746	1,583	1,271	1,263	1,823	2,431	2,445	2,176	779	627	682	1,041
1969	Wet	1,040	1,521	1,291	7,443	21,550	15,011	17,597	22,259	19,148	6,939	1,894	1,843
1970	Above Normal	2,458	2,038	2,079	11,358	5,029	5,878	3,785	2,700	876	787	740	1,157
1971	Below Normal	1,414	1,618	1,574	1,492	1,668	2,641	3,659	2,909	950	689	698	1,042
1972	Dry	1,221	1,450	1,467	1,001	1,478	1,595	2,380	1,709	747	596	664	893
1973	Above Normal	980	1,657	1,409	1,640	4,372	3,800	3,999	3,501	1,335	1,185	1,706	1,668
1974	Wet	1,807	2,472	3,723	5,390	3,539	6,871	5,281	3,965	3,972	2,027	1,691	1,826
1975	Wet	2,116	2,288	1,653	1,330	5,800	6,906	4,768	3,328	5,326	2,557	1,809	1,735
1976	Critical	2,784	1,822	1,385	1,250	1,485	1,815	1,163	1,081	518	394	556	929
1977	Critical	817	1,105	1,050	984	1,064	577	774	710	247	136	194	511
1978	Wet	686	1,043	1,053	2,413	5,740	6,689	9,182	7,926	9,969	3,192	1,927	2,467
1979	Above Normal	1,240	2,030	1,491	3,439	7,255	8,161	4,413	7,411	1,097	936	1,515	1,541
1980	Wet	1,690	1,908	1,708	10,467	17,725	10,979	4,912	4,459	9,151	5,953	1,979	1,864
1981	Dry	1,709	2,004	1,402	1,634	1,863	2,624	3,201	2,078	725	590	676	1,020
1982	Wet	1,240	1,582	1,518	2,436	10,497	11,460	22,735	14,285	8,955	6,109	2,185	4,247
1983	Wet	4,979	7,113	15,700	19,127	24,299	38,927	18,442	20,916	21,660	17,359	5,537	3,892
1984	Above Normal	2,967	10,450	16,586	9,582	6,111	5,044	3,472	2,750	1,123	944	1,046	1,396
1985	Dry	1,924	2,086	1,236	1,341	2,246	2,390	2,369	1,637	875	658	729	1,040
1986	Wet	1,122	1,497	1,268	1,077	13,298	20,533	7,896	8,079	6,732	1,695	1,814	1,990
1987	Critical	2,100	2,557	1,407	1,309	1,750	2,394	1,207	1,081	528	374	444	825
1988	Critical	862	1,322	1,051	1,046	1,251	1,512	929	825	399	202	294	700
1989	Critical	692	1,182	990	863	1,306	1,907	1,355	675	353	198	286	863
1990	Critical	802	1,255	965	877	1,349	1,438	576	833	348	209	292	704
1991	Critical	722	1,180	887	798	1,117	2,542	1,407	818	309	172	249	525
1992	Critical	715	1,109	837	774	1,885	1,836	723	601	260	163	199	513
1993	Wet	631	1,103	938	3,849	2,729	2,842	3,055	3,102	8,077	3,714	1,602	1,625
1994	Critical	1,699	1,702	1,186	1,029	1,696	1,459	955	859	365	160	278	542
1995	Wet	683	1,148	879	2,930	2,238	18,521	10,606	17,735	12,849	17,598	3,667	1,922
1996	Wet	1,572	1,695	1,267	1,942	10,884	8,796	5,338	5,000	3,606	1,323	1,582	1,614
1997	Wet	1,590	2,656	14,435	49,363	12,108	5,385	3,552	3,292	2,124	746	801	1,579
1998	Wet	1,436	1,455	1,242	3,524	18,827	11,180	11,425	12,804	16,745	15,872	2,205	1,939
1999	Above Normal	2,089	1,858	1,480	3,356	8,243	5,354	4,125	2,764	1,025	771	872	1,221
2000	Above Normal	1,245	1,498	1,068	1,285	9,229	7,039	4,502	3,408	1,905	751	981	1,470
2001	Dry	1,757	1,676	1,232	1,288	1,724	3,227	2,489	1,658	729	455	564	913
2002	Dry	907	1,351	1,375	1,403	1,390	1,897	1,954	1,316	610	461	556	876
2003	Below Normal	878	1,302	1,216	1,004	1,334	1,713	3,214	2,521	620	437	540	891
	Average	1,399	1,831	2,233	3,421	4,896	5,256	4,684	4,026	3,170	2,087	1,087	1,321
	Wet	1,494	1,920	3,159	7,013	9,827	10,943	9,173	8,848	8,832	5,691	2,076	2,007
	Above Normal	1,484	2,287	3,209	3,617	5,429	4,785	4,488	3,165	1,244	938	1,087	1,391
	Below Normal	1,272	1,704	1,493	1,479	2,301	2,594	3,386	2,348	949	648	659	1,020
	Dry	1,523	1,702	1,404	1,380	1,880	2,296	2,424	1,732	724	533	609	991
	Critical	1,176	1,449	1,143	1,071	1,523	1,764	1,036	883	397	260	342	735

Source: CALSIM II Modeling (Node C630)  
Notes:  
Simulation Period: WY 1922 -2003  
Year type as defined by the San Joaquin Valley Index Year Type  
Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

**Table 139: Simulated End-of-Month New Melones Reservoir storage (TAF) - No-Action Alternative**

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	998	1,008	1,038	1,069	1,177	1,249	1,245	1,464	1,719	1,680	1,601	1,552
1923	Below Normal	1,523	1,532	1,592	1,650	1,695	1,654	1,665	1,755	1,764	1,702	1,607	1,572
1924	Critical	1,557	1,543	1,549	1,559	1,554	1,485	1,415	1,336	1,280	1,235	1,184	1,172
1925	Dry	1,161	1,162	1,171	1,185	1,323	1,400	1,430	1,570	1,624	1,586	1,504	1,466
1926	Dry	1,439	1,428	1,428	1,431	1,489	1,483	1,521	1,469	1,405	1,327	1,253	1,217
1927	Wet	1,198	1,209	1,256	1,301	1,441	1,504	1,559	1,647	1,738	1,668	1,583	1,556
1928	Above Normal	1,557	1,585	1,603	1,612	1,653	1,811	1,787	1,828	1,773	1,677	1,584	1,543
1929	Critical	1,515	1,517	1,520	1,521	1,526	1,494	1,454	1,405	1,376	1,313	1,250	1,220
1930	Dry	1,197	1,183	1,180	1,201	1,222	1,265	1,242	1,194	1,203	1,138	1,070	1,034
1931	Critical	1,027	1,038	1,036	1,049	1,045	1,006	935	845	798	749	692	665
1932	Dry	631	632	676	709	818	852	858	1,027	1,167	1,142	1,079	1,037
1933	Critical	1,016	1,001	1,004	1,015	1,011	992	940	908	934	871	804	769
1934	Critical	760	757	772	796	820	823	752	649	602	547	487	460
1935	Below Normal	431	429	435	469	493	544	680	869	985	934	864	825
1936	Below Normal	821	827	837	912	1,089	1,166	1,274	1,447	1,530	1,474	1,399	1,363
1937	Below Normal	1,347	1,336	1,344	1,366	1,464	1,561	1,571	1,727	1,770	1,694	1,612	1,567
1938	Wet	1,539	1,536	1,611	1,682	1,864	2,030	2,161	2,420	2,420	2,300	2,130	2,000
1939	Dry	1,955	1,933	1,929	1,936	1,942	1,959	1,887	1,781	1,713	1,635	1,556	1,528
1940	Above Normal	1,495	1,473	1,473	1,569	1,700	1,858	1,926	2,040	2,017	1,919	1,828	1,776
1941	Wet	1,742	1,723	1,747	1,793	1,871	1,970	1,981	2,127	2,159	2,100	2,010	1,954
1942	Wet	1,924	1,905	1,937	1,970	1,970	2,019	2,094	2,242	2,351	2,300	2,130	2,000
1943	Wet	1,955	1,965	1,964	1,970	1,970	2,030	2,142	2,193	2,172	2,089	2,001	1,946
1944	Dry	1,908	1,889	1,880	1,876	1,883	1,901	1,827	1,775	1,763	1,686	1,599	1,557
1945	Below Normal	1,548	1,578	1,599	1,630	1,755	1,830	1,801	1,869	1,911	1,843	1,748	1,706
1946	Below Normal	1,701	1,722	1,798	1,854	1,903	1,945	1,964	2,044	2,001	1,907	1,815	1,772
1947	Dry	1,750	1,757	1,768	1,775	1,787	1,763	1,690	1,620	1,583	1,518	1,453	1,424
1948	Below Normal	1,429	1,423	1,419	1,421	1,405	1,400	1,399	1,433	1,546	1,489	1,418	1,382
1949	Dry	1,373	1,366	1,372	1,379	1,378	1,405	1,376	1,427	1,428	1,367	1,305	1,269
1950	Below Normal	1,237	1,211	1,211	1,260	1,325	1,374	1,364	1,480	1,558	1,500	1,430	1,408
1951	Above Normal	1,404	1,676	1,970	1,970	1,970	2,030	2,015	2,011	1,949	1,855	1,764	1,713
1952	Wet	1,685	1,690	1,733	1,866	1,949	2,030	2,096	2,404	2,420	2,300	2,130	2,000
1953	Wet	1,948	1,942	1,951	1,970	1,970	1,967	1,914	1,844	1,904	1,855	1,771	1,726
1954	Above Normal	1,695	1,688	1,693	1,701	1,707	1,749	1,726	1,786	1,759	1,685	1,611	1,568
1955	Dry	1,532	1,531	1,539	1,564	1,576	1,571	1,549	1,503	1,511	1,441	1,367	1,324
1956	Wet	1,299	1,303	1,548	1,808	1,929	1,987	1,996	2,142	2,213	2,156	2,064	1,997
1957	Above Normal	1,955	1,940	1,940	1,948	1,970	1,998	1,894	1,901	1,932	1,843	1,759	1,711
1958	Wet	1,674	1,667	1,664	1,707	1,778	1,924	2,072	2,378	2,420	2,300	2,130	2,000
1959	Below Normal	1,955	1,938	1,935	1,950	1,970	1,982	1,895	1,763	1,704	1,630	1,553	1,549
1960	Dry	1,519	1,505	1,505	1,506	1,541	1,539	1,506	1,448	1,413	1,349	1,289	1,245
1961	Dry	1,202	1,216	1,230	1,239	1,240	1,219	1,181	1,129	1,075	1,019	962	931
1962	Below Normal	899	899	900	907	989	1,023	1,048	1,089	1,152	1,108	1,037	993
1963	Wet	980	981	997	1,051	1,183	1,235	1,258	1,459	1,561	1,514	1,441	1,416
1964	Dry	1,418	1,445	1,461	1,496	1,505	1,476	1,428	1,373	1,361	1,296	1,232	1,191
1965	Wet	1,183	1,200	1,411	1,616	1,721	1,768	1,827	1,899	1,935	1,889	1,819	1,775
1966	Below Normal	1,732	1,755	1,778	1,807	1,833	1,849	1,795	1,783	1,716	1,633	1,555	1,507
1967	Wet	1,468	1,474	1,550	1,647	1,709	1,809	1,881	2,092	2,345	2,300	2,130	2,000
1968	Below Normal	1,955	1,951	1,948	1,959	1,970	2,009	1,924	1,841	1,785	1,701	1,619	1,571
1969	Wet	1,555	1,575	1,580	1,877	1,970	2,030	2,185	2,420	2,420	2,300	2,130	2,000
1970	Wet	1,955	1,955	1,964	1,970	1,970	2,030	1,966	1,964	1,953	1,852	1,752	1,712
1971	Wet	1,681	1,703	1,761	1,811	1,849	1,885	1,829	1,823	1,869	1,798	1,707	1,664
1972	Below Normal	1,630	1,638	1,678	1,708	1,716	1,713	1,628	1,637	1,604	1,536	1,467	1,441
1973	Above Normal	1,432	1,437	1,462	1,572	1,714	1,821	1,793	1,894	1,896	1,799	1,703	1,659
1974	Wet	1,659	1,700	1,764	1,871	1,943	2,030	2,118	2,241	2,239	2,162	2,062	1,997
1975	Wet	1,954	1,951	1,960	1,970	1,970	2,030	1,996	2,020	2,118	2,051	1,968	1,922
1976	Critical	1,914	1,918	1,928	1,929	1,928	1,868	1,782	1,686	1,614	1,555	1,505	1,471
1977	Critical	1,460	1,455	1,447	1,438	1,408	1,346	1,280	1,217	1,188	1,132	1,077	1,056
1978	Above Normal	1,014	998	1,009	1,087	1,174	1,312	1,407	1,535	1,652	1,634	1,558	1,554
1979	Below Normal	1,519	1,525	1,537	1,601	1,715	1,831	1,803	1,905	1,809	1,703	1,608	1,567
1980	Above Normal	1,559	1,567	1,570	1,867	1,970	2,030	2,059	2,112	2,151	2,130	2,040	1,992
1981	Dry	1,955	1,933	1,936	1,970	1,970	2,006	1,945	1,840	1,755	1,667	1,591	1,566
1982	Wet	1,557	1,612	1,739	1,939	1,970	2,030	2,220	2,360	2,401	2,300	2,130	2,000
1983	Wet	1,970	1,970	1,970	1,970	1,970	2,030	2,095	2,252	2,420	2,300	2,130	2,000
1984	Wet	1,955	1,970	1,970	1,970	1,970	2,030	1,959	1,963	1,935	1,863	1,791	1,765
1985	Dry	1,765	1,796	1,826	1,834	1,864	1,891	1,847	1,772	1,704	1,621	1,548	1,520
1986	Wet	1,513	1,517	1,527	1,601	1,970	2,030	2,070	2,105	2,103	2,006	1,925	1,901
1987	Dry	1,883	1,872	1,873	1,863	1,862	1,886	1,804	1,674	1,600	1,544	1,493	1,473
1988	Critical	1,450	1,431	1,419	1,423	1,411	1,366	1,313	1,239	1,200	1,162	1,126	1,094
1989	Dry	1,057	1,037	1,026	1,025	1,031	1,081	1,050	1,007	989	937	888	892
1990	Critical	913	915	930	943	958	925	861	791	738	680	639	615
1991	Critical	605	587	596	594	589	631	599	565	527	466	410	392
1992	Critical	389	378	393	407	457	476	448	368	314	258	199	172
1993	Above Normal	145	139	156	305	409	564	616	753	857	825	765	732
1994	Critical	738	757	787	817	828	770	720	673	619	551	489	455
1995	Wet	437	441	468	653	748	1,059	1,170	1,404	1,665	1,780	1,729	1,710
1996	Wet	1,703	1,692	1,717	1,790	1,970	2,030	2,045	2,167	2,140	2,046	1,970	1,932
1997	Wet	1,942	1,964	1,970	2,110	1,970	2,030	1,969	1,962	1,908	1,826	1,748	1,731
1998	Wet	1,708	1,717	1,737	1,844	1,970	2,030	2,074	2,171	2,377	2,300	2,130	2,000
1999	Wet	1,955	1,955	1,964	1,970	1,970	2,030	2,007	2,015	1,988	1,910	1,838	1,811
2000	Above Normal	1,797	1,786	1,793	1,843	1,948	2,030	2,011	1,998	1,974	1,882	1,806	1,784
2001	Dry	1,800	1,809	1,834	1,839	1,865	1,897	1,848	1,771	1,692	1,602	1,517	1,471
2002	Dry	1,440	1,440	1,474	1,517	1,529	1,564	1,543	1,500	1,447	1,378	1,312	1,285
2003	Above Normal	1,271	1,283	1,330	1,382	1,401	1,411	1,396	1,415	1,445	1,383	1,322	1,294
	Average	1,445	1,450	1,476	1,524	1,574	1,618	1,615	1,654	1,668	1,600	1,516	1,471
	Wet	1,621	1,628	1,672	1,759	1,829	1,907	1,949	2,066	2,122	2,049	1,937	1,866
	Above Normal	1,360	1,382	1,420	1,494	1,566	1,655	1,656	1,728	1,760	1,693	1,612	1,573
	Below Normal	1,409	1,412	1,429	1,464	1,523	1,563	1,558	1,617	1,631	1,561	1,481	1,445
	Dry	1,499	1,496	1,506	1,519	1,546	1,564	1,530	1,493	1,468	1,403	1,334	1,302
	Critical	1,112	1,108	1,115	1,124	1,128	1,098	1,042	973	932	877	822	795

San Joaquin River Restoration Program

Table 140: Simulated End-of-Month New Melones Reservoir storage (TAF) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	998	1,008	1,038	1,069	1,177	1,249	1,245	1,464	1,719	1,680	1,601	1,552
1923	Below Normal	1,523	1,532	1,592	1,650	1,695	1,694	1,706	1,797	1,808	1,749	1,654	1,617
1924	Critical	1,600	1,585	1,589	1,599	1,594	1,550	1,479	1,399	1,343	1,298	1,247	1,235
1925	Dry	1,223	1,224	1,233	1,247	1,385	1,460	1,485	1,627	1,680	1,639	1,555	1,516
1926	Dry	1,487	1,473	1,470	1,471	1,533	1,545	1,582	1,529	1,463	1,385	1,311	1,275
1927	Wet	1,256	1,267	1,314	1,359	1,498	1,561	1,611	1,689	1,777	1,705	1,621	1,590
1928	Above Normal	1,591	1,617	1,633	1,642	1,682	1,839	1,812	1,848	1,791	1,694	1,601	1,560
1929	Critical	1,532	1,532	1,535	1,536	1,544	1,530	1,489	1,439	1,408	1,345	1,282	1,251
1930	Dry	1,229	1,215	1,212	1,233	1,258	1,311	1,289	1,237	1,242	1,177	1,109	1,073
1931	Critical	1,065	1,076	1,075	1,087	1,084	1,070	999	908	860	811	754	727
1932	Dry	692	692	737	769	878	911	918	1,076	1,215	1,190	1,126	1,088
1933	Critical	1,069	1,056	1,061	1,072	1,074	1,070	1,024	995	1,020	957	890	852
1934	Critical	842	839	852	876	906	934	860	757	708	652	591	563
1935	Below Normal	533	530	534	567	591	641	776	969	1,084	1,033	962	921
1936	Below Normal	916	921	930	1,005	1,181	1,256	1,354	1,517	1,597	1,538	1,461	1,423
1937	Below Normal	1,406	1,394	1,401	1,421	1,518	1,614	1,617	1,764	1,805	1,727	1,644	1,599
1938	Wet	1,570	1,567	1,641	1,711	1,894	2,030	2,161	2,420	2,420	2,300	2,130	2,000
1939	Dry	1,955	1,933	1,929	1,936	1,942	1,959	1,887	1,781	1,712	1,634	1,555	1,527
1940	Above Normal	1,494	1,472	1,473	1,568	1,699	1,857	1,925	2,039	2,019	1,921	1,830	1,778
1941	Wet	1,744	1,725	1,749	1,795	1,873	1,972	1,983	2,129	2,161	2,102	2,012	1,956
1942	Wet	1,925	1,907	1,939	1,970	1,970	2,019	2,094	2,242	2,351	2,300	2,130	2,000
1943	Wet	1,955	1,965	1,964	1,970	1,970	2,030	2,142	2,193	2,172	2,089	2,001	1,946
1944	Dry	1,908	1,889	1,880	1,876	1,883	1,901	1,827	1,775	1,763	1,686	1,599	1,557
1945	Below Normal	1,548	1,578	1,599	1,630	1,755	1,830	1,803	1,872	1,929	1,861	1,767	1,724
1946	Below Normal	1,718	1,738	1,812	1,869	1,917	1,960	1,978	2,059	2,013	1,921	1,832	1,789
1947	Dry	1,765	1,771	1,779	1,786	1,798	1,786	1,712	1,634	1,596	1,530	1,465	1,443
1948	Below Normal	1,448	1,445	1,445	1,445	1,446	1,444	1,442	1,473	1,586	1,527	1,455	1,419
1949	Dry	1,410	1,402	1,407	1,414	1,417	1,443	1,421	1,471	1,473	1,411	1,349	1,313
1950	Below Normal	1,281	1,255	1,254	1,303	1,369	1,417	1,405	1,516	1,592	1,532	1,462	1,439
1951	Above Normal	1,435	1,705	1,970	1,970	1,970	2,030	2,018	2,014	1,957	1,863	1,772	1,719
1952	Wet	1,692	1,695	1,736	1,869	1,952	2,030	2,096	2,404	2,420	2,300	2,130	2,000
1953	Wet	1,948	1,942	1,951	1,970	1,970	1,977	1,924	1,854	1,916	1,868	1,783	1,740
1954	Above Normal	1,709	1,701	1,705	1,713	1,725	1,766	1,743	1,800	1,772	1,698	1,623	1,580
1955	Dry	1,544	1,543	1,550	1,575	1,591	1,595	1,577	1,530	1,537	1,466	1,391	1,348
1956	Wet	1,323	1,327	1,571	1,831	1,952	2,011	2,022	2,171	2,242	2,185	2,096	2,000
1957	Above Normal	1,955	1,937	1,934	1,942	1,970	2,001	1,896	1,904	1,934	1,846	1,762	1,713
1958	Wet	1,677	1,669	1,667	1,709	1,781	1,926	2,074	2,381	2,420	2,300	2,130	2,000
1959	Below Normal	1,955	1,938	1,935	1,950	1,970	1,982	1,895	1,763	1,704	1,630	1,553	1,549
1960	Dry	1,519	1,505	1,505	1,506	1,541	1,557	1,526	1,466	1,429	1,366	1,305	1,262
1961	Dry	1,218	1,232	1,246	1,255	1,252	1,253	1,215	1,162	1,108	1,052	995	964
1962	Below Normal	932	932	932	940	1,022	1,056	1,078	1,114	1,177	1,133	1,062	1,021
1963	Wet	1,007	1,010	1,028	1,082	1,213	1,265	1,294	1,489	1,590	1,542	1,468	1,440
1964	Dry	1,441	1,466	1,480	1,513	1,528	1,515	1,467	1,411	1,398	1,333	1,269	1,228
1965	Wet	1,220	1,237	1,447	1,652	1,758	1,804	1,863	1,935	1,973	1,926	1,856	1,812
1966	Below Normal	1,769	1,792	1,814	1,842	1,868	1,884	1,824	1,806	1,738	1,654	1,575	1,527
1967	Wet	1,488	1,494	1,569	1,666	1,727	1,827	1,899	2,110	2,363	2,300	2,130	2,000
1968	Below Normal	1,955	1,951	1,948	1,959	1,970	2,009	1,924	1,841	1,785	1,701	1,619	1,571
1969	Wet	1,555	1,575	1,580	1,877	1,970	2,030	2,185	2,420	2,420	2,300	2,130	2,000
1970	Wet	1,955	1,955	1,964	1,970	1,970	2,030	1,968	1,966	1,959	1,859	1,759	1,718
1971	Wet	1,688	1,709	1,768	1,818	1,856	1,891	1,835	1,829	1,877	1,807	1,715	1,672
1972	Below Normal	1,639	1,646	1,686	1,716	1,731	1,736	1,656	1,664	1,628	1,560	1,490	1,465
1973	Above Normal	1,455	1,460	1,485	1,594	1,735	1,842	1,814	1,911	1,889	1,789	1,690	1,648
1974	Wet	1,648	1,691	1,758	1,864	1,936	2,030	2,118	2,242	2,241	2,164	2,067	2,000
1975	Wet	1,955	1,949	1,957	1,970	1,970	2,030	1,999	2,023	2,121	2,053	1,971	1,921
1976	Critical	1,914	1,915	1,924	1,925	1,924	1,875	1,793	1,698	1,626	1,568	1,517	1,484
1977	Critical	1,472	1,467	1,460	1,451	1,421	1,358	1,293	1,229	1,201	1,144	1,090	1,068
1978	Above Normal	1,026	1,010	1,022	1,100	1,186	1,324	1,418	1,544	1,661	1,642	1,566	1,562
1979	Below Normal	1,527	1,533	1,544	1,608	1,722	1,838	1,812	1,915	1,821	1,718	1,624	1,578
1980	Above Normal	1,570	1,576	1,576	1,873	1,970	2,030	2,059	2,112	2,151	2,130	2,040	1,992
1981	Dry	1,955	1,933	1,936	1,970	1,970	2,006	1,945	1,840	1,754	1,667	1,591	1,566
1982	Wet	1,557	1,611	1,739	1,939	1,970	2,030	2,220	2,360	2,401	2,300	2,130	2,000
1983	Wet	1,970	1,970	1,970	1,970	1,970	2,030	2,095	2,252	2,420	2,300	2,130	2,000
1984	Wet	1,955	1,970	1,970	1,970	1,970	2,030	1,962	1,966	1,938	1,866	1,795	1,767
1985	Dry	1,767	1,797	1,826	1,834	1,864	1,891	1,847	1,772	1,706	1,624	1,551	1,522
1986	Wet	1,515	1,518	1,527	1,601	1,970	2,030	2,070	2,105	2,103	2,006	1,925	1,901
1987	Dry	1,883	1,872	1,873	1,863	1,862	1,886	1,804	1,677	1,601	1,544	1,494	1,473
1988	Critical	1,449	1,429	1,416	1,420	1,414	1,392	1,338	1,263	1,222	1,185	1,147	1,115
1989	Dry	1,076	1,057	1,046	1,044	1,047	1,123	1,098	1,053	1,033	981	932	936
1990	Critical	956	958	973	986	989	978	911	840	784	726	685	661
1991	Critical	650	632	641	639	633	675	653	617	577	516	460	441
1992	Critical	438	426	441	454	505	549	519	426	369	313	254	226
1993	Above Normal	199	193	209	358	462	617	674	816	919	887	826	794
1994	Critical	799	817	847	877	894	856	804	755	693	625	563	528
1995	Wet	510	513	540	725	819	1,130	1,238	1,468	1,723	1,838	1,785	1,766
1996	Wet	1,758	1,747	1,771	1,843	1,970	2,030	2,045	2,167	2,140	2,046	1,970	1,932
1997	Wet	1,942	1,964	1,970	2,110	1,970	2,030	1,969	1,963	1,909	1,828	1,754	1,736
1998	Wet	1,716	1,721	1,738	1,845	1,970	2,030	2,074	2,171	2,377	2,300	2,130	2,000
1999	Wet	1,955	1,955	1,964	1,970	1,970	2,030	2,010	2,018	1,993	1,916	1,844	1,814
2000	Above Normal	1,804	1,792	1,797	1,847	1,951	2,030	2,011	1,998	1,973	1,882	1,806	1,780
2001	Dry	1,796	1,805	1,829	1,834	1,860	1,892	1,846	1,770	1,694	1,607	1,523	1,475
2002	Dry	1,445	1,444	1,478	1,520	1,538	1,585	1,572	1,526	1,472	1,402	1,336	1,309
2003	Above Normal	1,294	1,306	1,353	1,404	1,429	1,456	1,444	1,452	1,480	1,418	1,356	1,330
Average		1,467	1,471	1,496	1,544	1,593	1,643	1,640	1,678	1,691	1,623	1,539	1,492
Wet		1,634	1,641	1,684	1,771	1,840	1,917	1,960	2,076	2,132	2,058	1,946	1,873
Above Normal		1,377	1,398	1,433	1,507	1,580	1,670	1,671	1,742	1,772	1,704	1,623	1,584
Below Normal		1,439	1,442	1,459	1,493	1,553	1,597	1,591	1,648	1,662	1,592	1,511	1,474
Dry		1,517	1,514	1,523	1,536	1,564	1,590	1,557	1,519	1,493	1,427	1,359	1,326
Critical		1,149	1,144	1,151	1,160	1,165	1,153	1,097	1,027	984	928	873	846

**Table 141: Simulated Stanislaus River Inflow to San Joaquin River (cfs) - No-Action Alternative**

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	310	269	320	251	296	457	1,258	1,068	387	376	422	426
1923	Below Normal	683	520	569	406	283	1,042	1,512	1,432	867	480	425	463
1924	Critical	832	490	435	367	422	535	543	520	308	365	411	415
1925	Dry	552	444	400	224	188	279	1,112	976	387	376	422	426
1926	Dry	601	403	345	257	314	440	592	630	314	376	422	426
1927	Wet	555	513	346	246	179	407	1,438	1,121	391	376	422	426
1928	Above Normal	690	466	422	364	293	571	1,271	1,119	342	376	422	426
1929	Critical	674	392	370	366	350	469	625	698	337	365	411	415
1930	Dry	539	320	257	239	366	472	627	573	318	365	411	415
1931	Critical	537	302	255	199	439	577	465	455	312	365	411	415
1932	Dry	523	329	464	235	131	174	436	494	334	376	422	426
1933	Critical	546	361	296	232	383	414	512	705	334	376	422	426
1934	Critical	538	314	361	230	333	528	412	564	330	365	411	415
1935	Below Normal	511	313	300	237	103	265	793	789	384	553	422	426
1936	Below Normal	551	291	256	251	636	295	801	595	709	474	422	429
1937	Below Normal	568	369	366	259	255	566	1,249	1,042	624	474	422	426
1938	Wet	680	482	505	380	494	1,533	1,811	2,029	5,122	2,000	1,855	1,993
1939	Dry	1,313	647	571	462	403	320	1,020	1,001	305	376	422	439
1940	Above Normal	680	348	307	427	295	592	1,779	1,525	1,009	502	447	477
1941	Wet	795	616	600	562	537	801	1,875	2,310	1,806	632	469	469
1942	Wet	825	851	646	1,247	1,956	682	1,637	1,644	1,695	784	1,721	1,905
1943	Wet	1,052	688	825	2,482	2,353	3,395	1,500	1,648	1,828	486	493	529
1944	Dry	872	672	685	586	624	559	1,399	1,101	494	455	444	431
1945	Below Normal	700	469	477	456	463	493	1,421	1,750	1,235	554	503	508
1946	Below Normal	781	495	366	655	594	487	1,477	1,654	1,017	441	477	493
1947	Dry	757	506	509	517	486	482	1,016	909	385	347	377	386
1948	Below Normal	576	474	425	372	570	562	727	816	559	504	423	395
1949	Dry	563	414	402	300	452	262	599	522	488	377	393	372
1950	Below Normal	502	419	429	271	218	413	909	892	773	390	389	401
1951	Above Normal	542	465	2,051	2,243	2,323	904	1,533	1,732	998	403	408	403
1952	Wet	664	472	414	403	341	845	1,500	1,564	4,291	2,614	1,977	1,847
1953	Wet	856	625	614	1,046	1,153	658	1,451	1,879	1,011	607	442	471
1954	Above Normal	775	483	474	460	512	395	1,187	1,207	394	369	377	351
1955	Dry	611	457	490	552	395	500	782	633	334	326	340	351
1956	Wet	509	397	369	761	506	597	1,753	1,592	1,921	613	484	1,023
1957	Above Normal	870	536	523	509	668	497	1,556	1,495	824	447	441	467
1958	Wet	765	505	488	437	558	515	2,123	1,500	2,981	1,806	1,869	1,839
1959	Below Normal	867	651	694	602	964	565	1,260	1,193	335	346	384	425
1960	Dry	638	428	407	408	465	561	730	722	328	320	345	333
1961	Dry	468	363	365	259	472	591	573	555	310	281	302	303
1962	Below Normal	425	375	379	212	248	304	547	779	278	411	395	394
1963	Wet	529	397	357	268	376	325	990	808	735	496	435	428
1964	Dry	597	372	310	319	478	558	676	785	319	338	363	374
1965	Wet	510	396	258	369	162	462	1,650	1,864	1,350	467	528	528
1966	Below Normal	821	523	499	509	587	468	1,169	1,074	329	331	345	342
1967	Wet	606	362	351	337	484	501	1,626	1,500	1,910	2,269	1,999	2,028
1968	Below Normal	1,019	552	580	548	1,223	444	1,447	1,290	348	334	370	369
1969	Wet	673	417	438	416	2,701	2,006	1,937	1,974	3,968	2,089	1,843	1,745
1970	Wet	1,332	637	926	4,827	2,908	1,283	1,801	1,509	1,181	462	474	553
1971	Wet	803	414	425	448	492	626	1,704	1,626	824	549	473	517
1972	Below Normal	954	379	331	447	584	598	1,157	1,023	329	342	362	359
1973	Above Normal	549	396	402	325	482	420	1,716	1,419	1,235	432	445	530
1974	Wet	741	451	440	369	570	1,287	1,895	1,606	1,958	557	500	790
1975	Wet	1,344	587	694	608	1,383	1,441	1,896	1,552	1,937	589	582	603
1976	Critical	711	655	482	520	534	534	991	900	325	316	331	320
1977	Critical	502	405	393	290	602	576	496	636	265	255	259	233
1978	Above Normal	364	280	293	262	188	245	956	862	597	544	442	471
1979	Below Normal	679	517	459	245	291	360	1,645	1,328	1,663	426	439	452
1980	Above Normal	722	494	372	322	3,280	1,060	1,952	1,920	2,016	561	546	656
1981	Dry	1,063	676	596	583	512	460	1,246	1,292	306	404	356	384
1982	Wet	671	355	384	454	5,140	3,466	2,882	1,586	1,703	1,432	1,967	3,096
1983	Wet	2,228	2,550	3,187	4,117	5,160	6,162	1,577	1,690	5,557	4,507	2,694	3,113
1984	Wet	1,830	3,321	5,140	2,078	2,245	1,097	1,865	1,800	1,065	499	568	712
1985	Dry	926	521	405	453	555	502	1,225	1,236	358	300	364	452
1986	Wet	709	533	461	371	2,463	5,074	1,880	1,672	1,619	503	366	497
1987	Dry	861	601	702	525	404	390	993	981	322	314	333	301
1988	Critical	501	347	379	289	533	589	601	559	305	270	260	295
1989	Dry	406	343	362	198	165	551	603	566	302	349	361	402
1990	Critical	440	352	341	180	193	591	516	550	287	285	321	314
1991	Critical	530	540	320	142	156	229	455	505	291	276	306	286
1992	Critical	422	411	271	116	220	504	404	212	222	252	267	249
1993	Above Normal	313	213	223	337	160	164	471	456	354	286	352	426
1994	Critical	356	331	316	141	368	571	428	452	214	254	277	292
1995	Wet	330	276	289	529	202	514	1,395	1,431	619	386	387	366
1996	Wet	606	480	481	429	420	2,721	1,621	1,678	1,595	399	442	442
1997	Wet	706	755	3,595	8,177	6,243	1,409	1,554	1,571	892	449	418	418
1998	Wet	757	405	394	440	2,623	2,051	1,565	1,518	1,553	2,706	2,230	2,231
1999	Wet	1,717	923	987	1,520	3,434	1,253	1,542	1,547	1,451	366	418	444
2000	Above Normal	686	420	411	465	451	692	1,549	1,507	825	371	374	390
2001	Dry	632	403	382	415	418	350	995	952	308	305	285	304
2002	Dry	475	299	365	333	436	395	712	678	308	301	349	335
2003	Above Normal	421	294	323	185	476	496	792	582	309	335	321	299
Average		711	519	587	669	894	835	1,200	1,148	969	606	581	624
Wet		877	708	908	1,282	1,734	1,581	1,710	1,624	1,960	1,102	1,002	1,116
Above Normal		577	389	510	513	785	541	1,335	1,241	774	417	417	443
Below Normal		688	453	438	391	501	490	1,151	1,118	675	433	413	420
Dry		689	455	445	381	404	436	852	812	345	349	373	381
Critical		549	408	352	256	378	510	537	563	294	312	341	340

Source: CALSIM II Modeling (Node C528)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Sacramento Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 142: Simulated Stanislaus River Inflow to San Joaquin River (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	310	269	320	251	296	457	1,258	1,068	387	376	422	426
1923	Below Normal	683	520	569	406	283	380	1,512	1,432	867	480	425	463
1924	Critical	832	519	463	367	422	141	549	526	308	365	411	415
1925	Dry	553	445	401	225	188	302	1,194	930	387	376	422	426
1926	Dry	618	454	396	280	243	147	600	637	344	376	422	426
1927	Wet	556	514	347	248	179	419	1,563	1,260	413	376	422	434
1928	Above Normal	690	496	452	375	304	577	1,334	1,188	353	376	422	427
1929	Critical	674	398	376	371	299	177	638	716	364	365	411	415
1930	Dry	540	321	257	239	276	316	600	640	383	366	411	415
1931	Critical	538	303	255	201	439	154	472	462	311	365	411	415
1932	Dry	526	334	469	239	135	177	446	666	334	376	422	426
1933	Critical	548	321	255	234	279	164	402	652	345	376	422	426
1934	Critical	540	332	379	232	236	114	465	547	365	365	411	415
1935	Below Normal	517	337	324	244	111	268	812	730	384	553	422	426
1936	Below Normal	553	311	277	255	636	330	957	738	709	474	422	429
1937	Below Normal	594	383	380	294	252	577	1,367	1,173	630	474	422	426
1938	Wet	680	493	516	390	494	2,007	1,811	2,029	5,122	2,000	1,855	1,993
1939	Dry	1,313	647	571	462	403	320	1,020	1,001	321	376	422	439
1940	Above Normal	680	348	307	427	295	592	1,779	1,524	961	501	446	476
1941	Wet	794	616	599	562	537	802	1,875	2,310	1,812	632	469	469
1942	Wet	825	851	647	1,271	1,956	682	1,637	1,644	1,695	784	1,721	1,905
1943	Wet	1,052	688	825	2,482	2,353	3,395	1,500	1,648	1,828	486	493	529
1944	Dry	872	672	685	586	624	559	1,399	1,101	494	455	444	431
1945	Below Normal	700	469	477	456	463	493	1,421	1,750	981	554	503	508
1946	Below Normal	781	514	386	655	594	489	1,487	1,665	1,037	443	479	494
1947	Dry	761	541	544	519	488	273	988	995	385	347	377	386
1948	Below Normal	579	416	366	376	486	335	744	849	559	504	423	395
1949	Dry	571	422	411	311	373	263	485	530	488	377	393	372
1950	Below Normal	503	420	430	273	210	429	889	993	773	390	389	401
1951	Above Normal	554	472	2,537	2,242	2,322	904	1,533	1,730	954	403	408	403
1952	Wet	664	497	438	403	341	898	1,500	1,564	4,291	2,614	1,977	1,847
1953	Wet	856	625	614	1,046	1,153	492	1,414	1,879	1,011	607	442	471
1954	Above Normal	775	494	485	460	412	398	1,187	1,247	407	369	377	358
1955	Dry	612	461	493	556	333	335	719	650	345	330	340	351
1956	Wet	512	399	369	760	511	597	1,753	1,592	1,921	613	484	1,483
1957	Above Normal	894	585	572	509	560	457	1,556	1,495	824	447	441	467
1958	Wet	765	505	488	437	558	515	2,123	1,500	3,022	1,806	1,869	1,839
1959	Below Normal	867	651	694	602	964	565	1,260	1,193	335	346	384	425
1960	Dry	638	428	407	408	465	258	703	759	351	320	345	333
1961	Dry	468	363	365	259	536	245	575	557	310	281	302	303
1962	Below Normal	426	375	380	212	248	305	577	869	278	411	395	394
1963	Wet	530	370	330	270	377	336	873	869	735	496	435	428
1964	Dry	605	407	345	330	388	296	682	790	329	338	363	374
1965	Wet	511	396	258	369	163	469	1,659	1,873	1,302	468	530	529
1966	Below Normal	824	529	506	516	594	475	1,246	1,158	337	331	345	342
1967	Wet	606	369	358	344	491	501	1,626	1,500	1,910	2,563	1,999	2,028
1968	Below Normal	1,019	552	580	548	1,223	444	1,447	1,290	348	334	370	369
1969	Wet	673	417	438	416	2,701	2,006	1,937	1,974	3,968	2,089	1,843	1,745
1970	Wet	1,332	637	926	4,827	2,908	1,283	1,733	1,509	1,138	462	474	553
1971	Wet	803	414	425	448	492	627	1,708	1,631	778	550	474	518
1972	Below Normal	956	380	331	448	453	463	1,079	1,023	334	342	362	359
1973	Above Normal	553	398	404	331	488	423	1,731	1,435	1,827	434	448	533
1974	Wet	746	412	401	371	573	1,175	1,895	1,606	1,958	557	500	864
1975	Wet	1,392	621	728	555	1,383	1,441	1,896	1,552	1,937	589	582	603
1976	Critical	711	686	512	520	534	349	984	893	325	316	331	320
1977	Critical	501	404	393	288	602	576	498	634	265	255	259	233
1978	Above Normal	364	281	294	263	189	250	976	880	597	544	442	471
1979	Below Normal	682	518	461	250	295	361	1,650	1,333	1,663	427	440	453
1980	Above Normal	723	536	414	323	3,383	1,060	1,952	1,920	2,016	561	546	656
1981	Dry	1,063	676	596	583	512	460	1,246	1,292	311	404	356	384
1982	Wet	671	355	384	454	5,135	3,466	2,882	1,586	1,703	1,432	1,967	3,096
1983	Wet	2,228	2,550	3,187	4,117	5,160	6,162	1,577	1,690	5,557	4,507	2,694	3,113
1984	Wet	1,830	3,321	5,140	2,078	2,245	1,097	1,865	1,800	1,065	499	568	712
1985	Dry	926	540	424	453	555	502	1,225	1,236	358	302	364	452
1986	Wet	709	546	474	371	2,464	5,074	1,880	1,672	1,619	503	366	497
1987	Dry	861	601	702	525	404	390	1,000	936	342	318	333	301
1988	Critical	501	360	393	289	445	208	612	571	336	278	286	295
1989	Dry	422	343	362	198	216	138	505	592	334	349	361	402
1990	Critical	440	353	342	180	410	238	562	566	323	285	321	314
1991	Critical	532	544	325	145	159	233	282	526	332	276	306	286
1992	Critical	425	418	277	120	224	80	432	425	261	252	267	249
1993	Above Normal	316	220	229	337	165	169	384	371	354	286	352	426
1994	Critical	360	338	323	145	264	219	474	477	333	254	277	292
1995	Wet	335	285	299	529	208	523	1,443	1,485	715	395	395	375
1996	Wet	623	488	490	438	1,346	2,721	1,621	1,678	1,595	399	442	442
1997	Wet	706	755	3,595	8,177	6,243	1,409	1,542	1,571	892	449	418	418
1998	Wet	757	455	444	440	2,649	2,064	1,565	1,518	1,553	2,706	2,230	2,231
1999	Wet	1,717	923	987	1,520	3,434	1,253	1,542	1,547	1,407	366	418	444
2000	Above Normal	686	451	442	465	451	750	1,551	1,510	830	372	375	391
2001	Dry	633	434	413	416	418	348	937	931	316	311	285	304
2002	Dry	473	307	373	331	335	196	570	740	325	306	349	335
2003	Above Normal	424	296	325	188	375	218	751	743	325	335	321	299
Average		714	526	599	671	894	753	1,197	1,168	977	611	581	631
Wet		880	712	912	1,282	1,771	1,593	1,708	1,634	1,960	1,113	1,003	1,137
Above Normal		581	404	565	514	770	521	1,333	1,259	803	417	417	444
Below Normal		692	455	440	395	486	423	1,175	1,157	660	433	413	420
Dry		682	466	456	385	383	307	828	832	359	350	373	381
Critical		550	415	358	258	359	221	531	583	322	312	343	340

Source: CALSIM II Modeling (Node C528)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 143: Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	1,921	2,019	2,774	2,527	5,546	4,932	7,342	7,195	13,588	5,191	2,575	2,520
1923	Below Normal	2,582	2,468	4,107	5,863	4,951	3,274	6,792	5,632	3,198	2,290	2,459	2,766
1924	Critical	2,928	2,409	2,134	1,904	2,084	1,792	1,758	1,705	1,095	1,076	1,216	1,539
1925	Dry	1,737	1,941	1,948	1,656	2,710	2,431	5,315	5,380	2,222	1,613	1,543	1,914
1926	Dry	2,129	2,096	2,001	1,824	2,193	2,032	3,688	3,307	1,525	1,352	1,472	1,886
1927	Wet	1,971	2,322	2,110	2,003	3,895	3,203	5,430	5,141	2,348	1,934	1,852	2,208
1928	Above Normal	2,718	2,709	2,426	2,451	2,606	5,477	5,368	4,071	1,827	1,600	1,598	1,977
1929	Critical	2,262	2,170	2,027	1,939	2,156	1,999	2,576	2,413	1,411	1,255	1,363	1,802
1930	Dry	1,833	1,933	1,727	1,642	2,141	2,040	2,459	2,405	1,248	1,265	1,379	1,844
1931	Critical	1,859	1,958	1,809	1,652	2,056	1,648	1,358	1,488	1,125	1,155	1,201	1,557
1932	Dry	1,655	1,724	2,787	2,135	4,625	2,715	3,391	3,824	2,157	2,133	1,730	2,009
1933	Critical	2,301	2,159	1,928	1,880	2,122	2,081	2,539	2,560	1,539	1,337	1,433	1,732
1934	Critical	1,957	1,856	1,929	1,809	2,169	1,870	1,677	1,684	1,163	1,086	1,190	1,524
1935	Below Normal	1,701	1,827	1,860	2,469	2,240	2,788	5,916	5,246	2,559	2,066	1,744	2,083
1936	Below Normal	2,407	2,185	2,030	2,137	10,858	6,987	7,041	5,668	2,665	1,989	2,472	2,485
1937	Below Normal	2,754	2,322	2,267	2,905	15,670	10,800	9,341	9,951	3,122	2,417	2,466	2,499
1938	Wet	2,581	2,597	6,729	6,011	23,626	29,233	18,395	22,074	21,254	9,967	4,488	4,397
1939	Dry	3,971	2,918	2,471	2,438	2,945	3,186	4,009	3,474	1,510	1,401	1,533	2,025
1940	Above Normal	2,222	2,052	1,897	3,317	4,003	7,190	7,836	6,040	3,013	1,926	1,849	2,441
1941	Wet	2,596	2,390	4,137	4,668	15,671	11,762	10,012	9,851	6,891	6,423	2,941	2,647
1942	Wet	3,005	2,958	4,023	8,550	9,547	6,254	8,232	9,392	8,470	7,127	4,210	4,192
1943	Wet	3,121	3,048	3,239	12,966	9,606	20,041	8,857	6,388	5,289	2,761	2,638	2,505
1944	Dry	2,842	2,776	2,534	2,405	3,117	3,207	4,991	3,867	2,146	1,636	1,633	1,900
1945	Below Normal	2,317	2,372	2,241	2,388	10,305	8,226	6,241	5,739	3,013	3,056	2,783	2,583
1946	Below Normal	3,130	2,595	7,335	5,838	5,915	5,403	5,656	5,847	3,047	1,879	1,867	2,188
1947	Dry	2,734	2,579	3,198	2,692	2,953	1,996	2,593	2,510	1,554	1,271	1,433	1,811
1948	Below Normal	2,092	2,087	1,935	1,705	1,948	1,839	3,401	3,270	2,253	1,810	1,576	1,854
1949	Dry	2,138	2,080	1,900	1,755	2,153	2,460	2,620	2,629	1,890	1,404	1,498	1,789
1950	Below Normal	2,013	2,095	1,991	2,061	2,293	2,162	4,031	3,733	2,415	1,502	1,522	1,895
1951	Above Normal	2,090	2,667	15,258	13,846	9,666	6,050	5,547	5,002	2,459	1,596	1,566	1,851
1952	Wet	2,188	2,112	2,552	6,056	4,330	12,734	11,375	18,090	15,741	9,304	4,532	4,135
1953	Wet	2,703	2,586	2,509	4,211	4,335	2,299	5,086	5,199	2,329	1,957	1,651	1,940
1954	Above Normal	2,280	2,103	1,990	1,895	2,287	2,212	3,663	3,707	1,917	1,471	1,519	1,808
1955	Dry	2,037	1,952	2,083	2,527	2,128	1,993	2,640	2,617	1,532	1,324	1,419	1,753
1956	Wet	1,839	1,873	8,190	19,738	11,504	6,711	6,177	6,228	8,586	6,319	3,037	3,305
1957	Above Normal	2,895	2,420	2,198	2,135	2,455	2,299	5,111	5,044	2,300	1,616	1,647	1,980
1958	Wet	2,433	2,127	2,132	2,268	3,711	10,153	17,788	13,666	13,522	7,195	4,394	4,242
1959	Below Normal	2,871	2,494	2,462	2,419	3,634	2,920	4,033	3,492	1,482	1,318	1,442	1,979
1960	Dry	2,038	1,890	1,781	1,678	2,408	1,847	2,499	2,428	1,257	1,069	1,238	1,573
1961	Dry	1,543	1,772	1,750	1,479	1,939	1,729	1,507	1,598	1,137	924	1,047	1,416
1962	Below Normal	1,442	1,672	1,727	1,312	5,148	3,611	4,015	3,873	1,860	1,605	1,603	1,888
1963	Wet	2,034	1,812	1,804	1,969	3,070	2,458	5,362	4,766	2,650	1,983	1,791	2,138
1964	Dry	2,358	2,277	2,002	2,175	2,135	1,864	2,552	2,480	1,465	1,292	1,350	1,720
1965	Wet	1,911	1,883	2,917	8,560	6,234	5,239	7,313	5,367	3,013	1,995	3,258	2,931
1966	Below Normal	2,662	3,348	4,703	4,269	4,627	2,732	3,933	3,441	1,468	1,345	1,360	1,651
1967	Wet	1,921	1,736	2,735	2,823	2,554	4,978	15,224	14,573	17,124	16,363	4,855	4,606
1968	Below Normal	3,187	2,316	2,276	2,353	3,176	2,474	4,223	3,791	1,577	1,404	1,523	1,835
1969	Wet	2,032	1,984	2,099	9,729	27,880	21,067	20,853	25,844	26,119	9,922	4,304	4,090
1970	Wet	4,136	2,936	3,521	17,137	8,593	7,161	5,371	4,477	2,285	1,935	1,601	2,084
1971	Wet	2,624	2,161	2,246	2,533	2,447	2,841	5,215	4,923	2,174	1,711	1,554	1,896
1972	Below Normal	2,675	1,999	2,093	1,700	2,257	1,743	3,262	3,130	1,476	1,389	1,466	1,651
1973	Above Normal	1,941	2,101	2,055	2,219	4,887	4,446	5,048	4,577	3,398	2,014	2,531	2,571
1974	Wet	3,045	2,812	4,610	6,694	4,534	7,807	6,746	5,682	6,268	3,391	2,824	2,971
1975	Wet	3,821	3,116	2,724	2,577	7,589	7,844	6,443	4,976	7,308	3,700	2,896	2,633
1976	Critical	3,704	2,994	2,204	2,170	2,442	1,910	2,538	2,436	1,313	1,288	1,555	1,651
1977	Critical	1,770	1,770	1,655	1,493	1,770	1,296	1,592	1,767	817	730	785	1,039
1978	Above Normal	1,175	1,410	1,567	3,000	7,732	8,663	12,998	11,301	9,836	4,355	2,878	3,313
1979	Below Normal	2,352	2,900	2,490	4,065	8,034	8,885	6,173	8,549	3,283	1,796	2,473	3,376
1980	Above Normal	2,906	2,525	2,307	13,056	22,571	15,885	7,220	6,794	10,084	7,288	3,175	2,731
1981	Dry	3,292	2,956	2,232	2,416	2,517	2,795	4,265	3,902	1,563	1,525	1,452	1,779
1982	Wet	2,293	2,039	2,215	3,285	17,189	15,492	27,310	18,941	11,191	8,365	4,747	7,536
1983	Wet	7,548	11,019	20,889	26,506	34,197	48,429	22,510	25,351	28,560	24,381	9,214	7,982
1984	Wet	5,143	16,393	24,107	15,350	9,905	7,095	5,923	5,479	2,958	2,126	2,382	3,195
1985	Dry	3,703	3,039	2,108	2,360	3,018	2,649	3,418	3,391	1,597	1,580	1,749	2,103
1986	Wet	2,374	2,378	2,254	1,933	17,380	28,260	11,834	11,345	9,116	2,931	2,909	3,376
1987	Dry	3,779	3,490	2,358	2,087	2,121	2,579	2,431	2,357	1,290	1,172	1,339	1,697
1988	Critical	1,850	1,857	1,768	1,650	1,900	1,499	1,821	1,772	1,090	865	1,027	1,416
1989	Dry	1,206	1,650	1,679	1,392	1,643	1,823	1,735	1,538	964	963	1,157	1,815
1990	Critical	1,594	1,704	1,627	1,351	1,683	1,431	1,169	1,696	965	837	988	1,382
1991	Critical	1,527	1,740	1,492	1,169	1,373	2,352	1,478	1,532	988	847	951	1,124
1992	Critical	1,345	1,533	1,344	1,099	2,416	1,917	1,164	959	669	682	734	1,038
1993	Above Normal	1,072	1,307	1,391	4,682	3,542	3,004	2,539	2,552	6,925	4,323	2,335	2,605
1994	Critical	2,439	2,202	1,746	1,373	2,160	1,584	1,612	1,884	979	835	928	1,218
1995	Wet	1,300	1,522	1,407	3,700	4,217	19,489	13,243	23,129	14,239	19,515	4,754	2,934
1996	Wet	2,940	2,712	2,322	2,763	11,586	11,332	6,924	8,356	6,212	2,528	2,604	2,723
1997	Wet	2,927	3,729	21,247	60,094	22,938	9,068	5,288	5,331	2,588	1,892	2,020	2,484
1998	Wet	2,759	2,118	2,158	4,263	24,280	14,585	14,432	16,830	21,029	20,269	5,674	4,902
1999	Wet	4,772	3,397	3,223	5,095	11,670	6,675	6,161	5,402	3,276	1,889	2,044	2,345
2000	Above Normal	2,575	2,258	1,857	2,335	9,247	7,542	5,914	5,402	3,328	1,742	1,949	2,255
2001	Dry	2,870	2,574	2,284	2,393	2,421	3,623	3,344	3,138	1,495	1,287	1,453	1,849
2002	Dry	1,893	1,930	2,127	2,455	2,048	2,085	2,319	2,504	1,292	1,204	1,383	1,711
2003	Above Normal	1,558	1,694	1,912	1,627	1,991	1,942	3,114	3,153	1,402	1,327	1,492	1,738
Average		2,498	2,556	3,366	4,793	6,459	6,343	6,101	6,076	4,696	3,349	2,198	2,412
	Wet	2,924	3,298	5,311	9,288	11,634	12,393	10,673	11,031	9,636	6,842	3,430	3,477
	Above Normal	2,113	2,105	3,136	4,424	6,378	5,804	5,975	5,403	5,006	2,871	2,093	2,338
	Below Normal	2,442	2,334	2,823	2,963	5,790	4,560	5,290	5,097	2,387	1,848	1,911	2,122

San Joaquin River Restoration Program

Table 144: Simulated San Joaquin River Flow Upstream of Vernalis (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	1,993	2,237	2,774	2,527	5,689	5,664	7,569	7,134	13,631	5,197	2,581	2,544
1923	Below Normal	2,655	2,686	4,104	5,797	5,100	3,344	7,922	5,654	3,241	2,295	2,464	2,790
1924	Critical	2,928	2,438	2,163	1,904	2,084	2,129	1,758	1,705	1,096	1,076	1,216	1,539
1925	Dry	1,811	2,159	1,949	1,658	2,850	3,187	5,918	5,410	2,266	1,620	1,549	1,938
1926	Dry	2,219	2,365	2,052	1,847	2,262	2,471	4,286	3,330	1,599	1,359	1,478	1,911
1927	Wet	2,045	2,540	2,110	2,005	4,031	3,946	6,188	5,305	2,414	1,941	1,859	2,240
1928	Above Normal	2,790	2,957	2,456	2,463	2,749	6,524	6,030	4,214	1,882	1,606	1,604	2,002
1929	Critical	2,334	2,394	2,033	1,944	2,244	2,439	2,636	2,451	1,482	1,262	1,370	1,827
1930	Dry	1,906	2,151	1,727	1,643	2,192	2,617	2,538	2,439	1,384	1,300	1,407	1,878
1931	Critical	1,860	1,959	1,810	1,653	2,056	1,957	1,365	1,494	1,124	1,155	1,201	1,556
1932	Dry	1,731	1,945	2,792	2,139	4,759	3,450	4,655	4,334	2,201	2,140	1,737	2,033
1933	Critical	2,375	2,336	1,888	1,882	2,159	2,564	3,015	2,589	1,594	1,343	1,439	1,756
1934	Critical	2,031	2,092	1,947	1,811	2,212	2,188	1,763	1,723	1,242	1,087	1,190	1,548
1935	Below Normal	1,780	2,069	1,884	2,477	2,388	3,524	6,789	5,272	2,603	2,072	1,750	2,108
1936	Below Normal	2,482	2,424	2,050	2,141	9,553	7,901	8,172	5,698	2,709	2,150	2,478	2,509
1937	Below Normal	2,852	2,554	2,281	2,940	13,762	11,081	9,326	8,618	3,171	2,423	2,423	2,523
1938	Wet	2,654	2,825	6,739	5,883	22,174	29,012	16,772	21,685	20,869	9,973	4,494	4,421
1939	Dry	4,044	3,136	2,471	2,438	3,085	3,918	4,059	3,549	1,570	1,407	1,540	2,049
1940	Above Normal	2,294	2,270	1,897	3,317	4,113	7,922	9,062	6,063	3,012	1,937	1,881	2,467
1941	Wet	2,669	2,608	4,137	4,659	14,106	12,497	11,192	11,407	8,577	6,430	2,947	2,671
1942	Wet	3,078	3,176	4,017	7,917	9,676	6,986	9,458	9,438	8,517	7,138	4,220	4,218
1943	Wet	3,194	3,266	3,240	10,763	9,747	19,080	9,373	6,299	5,332	2,684	2,644	2,529
1944	Dry	2,915	2,987	2,534	2,405	3,248	3,939	5,589	3,940	2,190	1,642	1,640	1,925
1945	Below Normal	2,389	2,590	2,241	2,388	8,604	8,955	6,841	5,779	3,025	3,062	2,790	2,607
1946	Below Normal	3,203	2,832	7,585	5,838	6,055	6,137	6,268	5,878	3,111	1,888	1,875	2,401
1947	Dry	2,932	2,832	3,233	2,694	3,095	2,519	3,742	3,139	1,598	1,277	1,440	1,835
1948	Below Normal	2,168	2,247	1,876	1,710	1,995	2,344	3,966	3,300	2,298	1,818	1,583	1,879
1949	Dry	2,219	2,307	1,909	1,767	2,214	3,194	3,099	2,654	1,937	1,415	1,508	1,815
1950	Below Normal	2,087	2,313	1,992	2,063	2,425	2,911	4,635	3,755	2,458	1,509	1,528	1,919
1951	Above Normal	2,175	2,891	12,281	12,946	9,805	6,782	6,304	5,028	2,459	1,603	1,573	1,876
1952	Wet	2,260	2,354	2,577	6,295	4,643	12,774	12,045	16,377	15,224	9,310	4,538	4,160
1953	Wet	2,776	2,804	2,509	4,211	4,475	2,865	5,685	5,222	2,373	1,964	1,658	1,964
1954	Above Normal	2,353	2,333	2,001	1,895	2,327	2,948	4,298	3,790	1,974	1,478	1,525	1,839
1955	Dry	2,111	2,174	2,087	2,531	2,206	2,561	3,152	2,636	1,587	1,333	1,425	1,777
1956	Wet	1,915	2,094	6,652	19,430	11,326	7,238	6,778	7,624	10,162	6,326	3,043	3,789
1957	Above Normal	2,992	2,688	2,248	2,135	2,487	2,894	5,709	5,066	2,344	1,623	1,653	2,004
1958	Wet	2,506	2,345	2,132	2,268	3,851	10,326	19,178	14,570	13,353	7,201	4,400	4,266
1959	Below Normal	2,944	2,712	2,462	2,419	3,774	3,652	4,630	3,563	1,524	1,322	1,447	2,003
1960	Dry	2,110	2,108	1,781	1,678	2,539	2,275	2,554	2,455	1,324	1,076	1,244	1,598
1961	Dry	1,544	1,772	1,750	1,479	2,004	2,116	1,509	1,600	1,138	925	1,048	1,416
1962	Below Normal	1,515	1,890	1,727	1,312	5,289	4,344	5,304	4,523	1,905	1,612	1,611	1,913
1963	Wet	2,108	2,003	1,777	1,971	3,150	3,201	5,965	4,812	2,692	1,987	1,796	2,161
1964	Dry	2,439	2,530	2,038	2,186	2,176	2,334	2,603	2,507	1,519	1,299	1,357	1,745
1965	Wet	1,984	2,101	2,917	7,955	6,375	5,977	8,548	5,400	3,012	2,013	3,269	2,958
1966	Below Normal	2,738	3,573	4,710	4,276	4,774	3,470	4,610	3,598	1,520	1,351	1,367	1,676
1967	Wet	1,993	1,961	2,742	2,829	2,701	5,419	15,587	14,468	15,489	16,664	4,861	4,630
1968	Below Normal	3,259	2,534	2,276	2,353	3,307	3,206	4,272	3,865	1,620	1,410	1,529	1,860
1969	Wet	2,104	2,202	2,099	8,265	26,137	20,311	20,925	26,377	24,097	9,917	4,310	4,114
1970	Wet	4,208	3,154	3,521	16,774	8,746	7,918	5,939	4,548	2,285	1,940	1,606	2,108
1971	Wet	2,696	2,379	2,246	2,533	2,587	3,574	5,818	5,002	2,174	1,721	1,563	1,922
1972	Below Normal	2,750	2,218	2,094	1,701	2,257	2,340	3,783	3,152	1,524	1,395	1,472	1,675
1973	Above Normal	2,018	2,321	2,058	2,225	5,030	5,181	6,385	5,258	3,398	2,022	2,539	2,997
1974	Wet	3,122	3,106	4,571	5,952	4,676	8,426	7,631	5,879	6,391	3,398	2,830	3,070
1975	Wet	3,942	3,368	2,758	2,524	7,605	8,645	7,043	5,065	7,818	3,706	2,901	2,657
1976	Critical	3,704	3,027	2,234	2,170	2,442	2,458	2,538	2,436	1,313	1,288	1,555	1,651
1977	Critical	1,769	1,769	1,655	1,491	1,770	1,296	1,592	1,767	817	730	785	1,039
1978	Above Normal	1,248	1,553	1,568	3,001	6,259	8,040	11,614	11,056	11,167	4,360	2,884	3,337
1979	Below Normal	2,428	3,120	2,492	4,070	8,158	9,540	6,778	9,078	3,327	1,804	2,480	2,383
1980	Above Normal	2,980	2,785	2,349	11,174	21,718	15,261	6,998	7,450	11,909	7,295	3,181	2,755
1981	Dry	3,365	3,174	2,332	2,416	2,657	3,527	4,864	3,975	1,612	1,532	1,459	1,804
1982	Wet	2,365	2,257	2,215	3,320	16,050	15,874	27,144	17,471	11,841	8,371	4,753	7,560
1983	Wet	7,620	10,055	20,283	26,161	32,107	48,989	22,366	24,858	28,085	24,376	9,220	8,006
1984	Wet	5,228	16,044	23,205	14,754	10,036	7,827	6,650	5,503	3,001	2,132	2,388	3,219
1985	Dry	4,018	3,276	2,127	2,360	3,158	3,381	4,016	3,413	1,641	1,588	1,756	2,128
1986	Wet	2,446	2,609	2,268	1,933	16,111	27,515	11,600	10,932	9,664	2,937	2,915	3,400
1987	Dry	3,852	3,708	2,358	2,087	2,261	3,311	2,487	2,387	1,355	1,183	1,346	1,721
1988	Critical	1,922	2,088	1,782	1,650	1,943	1,850	1,881	1,805	1,164	879	1,059	1,441
1989	Dry	1,295	1,868	1,679	1,392	1,834	2,142	2,266	1,608	1,040	960	1,164	1,839
1990	Critical	1,667	1,923	1,627	1,352	2,040	1,809	1,297	1,756	1,045	843	994	1,406
1991	Critical	1,602	1,963	1,497	1,172	1,516	3,088	1,935	1,597	1,073	854	957	1,149
1992	Critical	1,421	1,757	1,351	1,103	2,551	2,225	1,274	1,216	752	690	741	1,063
1993	Above Normal	1,149	1,532	1,398	4,683	3,686	3,741	3,704	3,730	8,923	4,327	2,339	2,629
1994	Critical	2,515	2,427	1,753	1,377	2,195	1,963	1,694	1,950	1,141	834	933	1,242
1995	Wet	1,377	1,749	1,416	3,689	3,114	20,246	12,587	21,223	14,584	19,533	4,768	2,967
1996	Wet	3,030	2,938	2,330	2,771	12,643	11,581	8,006	7,639	6,255	2,534	2,610	2,747
1997	Wet	3,000	3,882	19,080	59,612	22,515	9,800	5,879	6,141	3,851	1,898	2,069	2,936
1998	Wet	2,852	2,378	2,208	4,237	22,445	14,954	14,117	15,509	18,705	20,278	5,680	4,927
1999	Wet	4,844	3,615	3,223	5,095	11,810	7,408	6,762	5,423	3,276	1,895	2,050	2,370
2000	Above Normal	2,648	2,506	1,887	2,335	9,966	8,416	6,519	5,778	3,482	1,748	1,966	2,641
2001	Dry	2,967	2,823	2,315	2,393	2,562	4,305	3,885	3,160	1,547	1,299	1,459	1,873
2002	Dry	1,964	2,156	2,136	2,453	2,087	2,617	2,823	2,530	1,355	1,218	1,391	1,737
2003	Above Normal	1,634	1,913	1,913	1,631	2,031	2,396	4,289	3,772	1,463	1,334	1,499	1,762
	Average	2,575	2,746	3,275	4,667	6,324	6,838	6,559	6,120	4,786	3,360	2,205	2,451
	Wet	3,001	3,454	5,114	8,993	11,263	12,784	11,124	10,930	9,617	6,856	3,438	3,539
	Above Normal	2,189	2,332	2,903	4,194	6,322	6,314	6,540	5,695	5,470	2,877	2,101	2,371
	Below Normal	2,518	2,554	2,841	2,963	5,531	5,196	5,950	5,124	2,431	1,865	1,918	2

**Table 145: Simulated San Joaquin River Inflows to Delta (cfs) - No-Action Alternative**

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	1,907	2,018	2,774	2,527	5,540	4,912	7,295	7,128	13,519	5,096	2,488	2,472
1923	Below Normal	2,569	2,467	4,108	5,863	4,945	3,254	6,744	5,564	3,129	2,194	2,373	2,720
1924	Critical	2,913	2,408	2,135	1,905	2,077	1,771	1,707	1,631	1,021	971	1,123	1,489
1925	Dry	1,724	1,941	1,948	1,656	2,704	2,415	5,275	5,324	2,165	1,533	1,471	1,875
1926	Dry	2,114	2,095	2,001	1,824	2,186	2,011	3,637	3,235	1,451	1,250	1,381	1,836
1927	Wet	1,957	2,320	2,110	2,003	3,888	3,182	5,382	5,074	2,278	1,838	1,766	2,162
1928	Above Normal	2,704	2,708	2,426	2,452	2,600	5,458	5,322	4,007	1,761	1,509	1,515	1,932
1929	Critical	2,246	2,169	2,027	1,939	2,149	1,978	2,524	2,340	1,336	1,150	1,269	1,752
1930	Dry	1,818	1,931	1,727	1,642	2,134	2,021	2,410	2,336	1,178	1,167	1,290	1,796
1931	Critical	1,845	1,957	1,809	1,652	2,049	1,627	1,308	1,418	1,054	1,054	1,111	1,508
1932	Dry	1,639	1,722	2,787	2,135	4,619	2,694	3,340	3,752	2,085	2,031	1,639	1,959
1933	Critical	2,286	2,157	1,928	1,880	2,115	2,062	2,491	2,491	1,468	1,238	1,344	1,683
1934	Critical	1,941	1,854	1,929	1,809	2,162	1,847	1,623	1,608	1,085	978	1,093	1,471
1935	Below Normal	1,688	1,825	1,860	2,469	2,233	2,770	5,872	5,186	2,498	1,981	1,667	2,042
1936	Below Normal	2,393	2,183	2,030	2,137	10,852	6,968	6,994	5,602	2,598	1,894	2,387	2,439
1937	Below Normal	2,742	2,320	2,267	2,905	15,663	10,782	9,299	9,892	3,060	2,331	2,389	2,458
1938	Wet	2,569	2,595	6,729	6,012	23,619	29,216	18,354	22,018	21,197	9,887	4,416	4,357
1939	Dry	3,958	2,917	2,471	2,438	2,938	3,167	3,961	3,407	1,441	1,304	1,447	1,977
1940	Above Normal	2,208	2,051	1,898	3,318	3,996	7,171	7,790	9,975	2,947	1,835	1,766	2,396
1941	Wet	2,584	2,388	4,137	4,668	15,665	11,745	9,969	9,792	6,833	6,341	2,865	2,606
1942	Wet	2,993	2,958	4,023	8,551	9,542	6,237	8,193	9,336	8,413	7,048	4,139	4,152
1943	Wet	3,109	3,046	3,240	12,967	9,600	20,024	8,815	6,329	5,229	2,678	2,563	2,464
1944	Dry	2,827	2,775	2,534	2,405	3,111	3,186	4,941	3,796	2,075	1,536	1,544	1,851
1945	Below Normal	2,303	2,370	2,241	2,389	10,298	8,207	6,194	5,675	2,947	2,963	2,700	2,538
1946	Below Normal	3,117	2,593	7,336	5,838	5,908	5,384	5,607	5,780	2,978	1,783	1,781	2,141
1947	Dry	2,719	2,578	3,198	2,693	2,947	1,975	2,543	2,438	1,482	1,168	1,341	1,760
1948	Below Normal	2,080	2,088	1,935	1,706	1,943	1,823	3,360	3,215	2,197	1,732	1,506	1,816
1949	Dry	2,125	2,079	1,901	1,755	2,146	2,441	2,574	2,563	1,825	1,312	1,416	1,743
1950	Below Normal	1,999	2,093	1,992	2,062	2,286	2,143	3,984	3,667	2,347	1,407	1,437	1,849
1951	Above Normal	2,074	2,665	15,258	13,846	9,659	6,029	5,497	4,933	2,388	1,497	1,477	1,803
1952	Wet	2,176	2,110	2,553	6,057	4,324	12,717	11,333	18,032	15,682	9,220	4,458	4,095
1953	Wet	2,690	2,585	2,509	4,212	4,328	2,280	5,040	5,133	2,261	1,865	1,567	1,893
1954	Above Normal	2,267	2,102	1,990	1,895	2,280	2,193	3,618	3,644	1,853	1,382	1,437	1,765
1955	Dry	2,023	1,951	2,084	2,527	2,121	1,974	2,593	2,551	1,464	1,230	1,333	1,707
1956	Wet	1,824	1,872	8,190	19,738	11,498	6,692	6,131	6,163	8,519	6,228	2,953	3,259
1957	Above Normal	2,882	2,419	2,199	2,135	2,448	2,280	5,064	4,979	2,234	1,525	1,564	1,935
1958	Wet	2,423	2,127	2,132	2,268	3,706	10,139	17,754	13,620	13,475	7,129	4,334	4,210
1959	Below Normal	2,856	2,493	2,462	2,420	3,628	2,899	3,981	3,418	1,408	1,214	1,348	1,929
1960	Dry	2,022	1,889	1,782	1,678	2,401	1,826	2,448	2,357	1,184	967	1,146	1,524
1961	Dry	1,529	1,771	1,750	1,479	1,933	1,709	1,459	1,530	1,068	827	961	1,370
1962	Below Normal	1,426	1,670	1,727	1,312	5,142	3,590	3,965	3,803	1,788	1,504	1,513	1,840
1963	Wet	2,022	1,811	1,805	1,969	3,063	2,440	5,321	4,708	2,591	1,900	1,716	2,096
1964	Dry	2,343	2,275	2,003	2,175	2,129	1,844	2,501	2,409	1,392	1,190	1,258	1,671
1965	Wet	1,897	1,881	2,917	8,561	6,227	5,220	7,267	5,301	2,947	1,902	3,173	2,884
1966	Below Normal	2,647	3,346	4,704	4,269	4,620	2,711	3,882	3,370	1,396	1,244	1,269	1,602
1967	Wet	1,909	1,735	2,735	2,823	2,547	4,961	15,183	14,516	17,067	16,283	4,782	4,566
1968	Below Normal	3,174	2,315	2,276	2,353	3,170	2,455	4,177	3,726	1,511	1,313	1,440	1,790
1969	Wet	2,018	1,983	2,099	9,730	27,874	21,046	20,807	25,778	26,052	9,829	4,218	4,043
1970	Wet	4,123	2,935	3,521	17,137	8,596	7,141	5,323	4,409	2,216	1,839	1,515	2,038
1971	Wet	2,611	2,159	2,246	2,534	2,441	2,822	5,169	4,856	2,108	1,618	1,469	1,849
1972	Below Normal	2,660	1,997	2,094	1,700	2,250	1,722	3,211	3,057	1,403	1,286	1,373	1,601
1973	Above Normal	1,927	2,099	2,056	2,220	4,880	4,427	5,004	4,514	3,334	1,924	2,450	2,526
1974	Wet	3,031	2,810	4,610	6,694	4,527	7,788	6,702	5,619	6,205	3,305	2,745	2,929
1975	Wet	3,807	3,114	2,724	2,578	7,582	7,825	6,398	4,913	7,244	3,611	2,814	2,588
1976	Critical	3,689	2,992	2,204	2,171	2,435	1,889	2,486	2,364	1,240	1,186	1,464	1,601
1977	Critical	1,756	1,769	1,655	1,493	1,763	1,277	1,542	1,697	745	630	697	991
1978	Above Normal	1,164	1,410	1,567	3,000	7,726	8,647	12,961	11,251	9,786	4,285	2,814	3,278
1979	Below Normal	2,337	2,899	2,490	4,066	8,028	8,865	6,123	8,480	3,212	1,697	2,384	2,309
1980	Above Normal	2,893	2,523	2,307	13,056	22,564	15,865	7,173	6,727	10,017	7,194	3,089	2,685
1981	Dry	3,281	2,955	2,333	2,416	2,511	2,778	4,222	3,841	1,502	1,439	1,374	1,736
1982	Wet	2,283	2,039	2,215	3,286	17,184	15,477	27,273	18,889	11,140	8,293	4,682	7,500
1983	Wet	7,536	11,019	20,889	26,506	34,193	48,413	22,471	25,298	28,508	24,308	9,146	7,945
1984	Wet	5,131	16,392	24,108	15,350	9,898	7,078	5,880	5,419	2,896	2,040	2,305	3,153
1985	Dry	3,688	3,038	2,108	2,360	3,011	2,629	3,368	3,321	1,527	1,482	1,661	2,055
1986	Wet	2,360	2,377	2,255	1,934	17,374	28,241	11,788	11,280	9,050	2,838	2,826	3,331
1987	Dry	3,764	3,489	2,358	2,087	2,114	2,558	2,380	2,286	1,219	1,072	1,250	1,648
1988	Critical	1,836	1,855	1,768	1,650	1,894	1,480	1,771	1,701	1,019	765	937	1,368
1989	Dry	1,192	1,648	1,679	1,392	1,636	1,802	1,686	1,469	895	854	1,069	1,767
1990	Critical	1,579	1,703	1,627	1,352	1,676	1,408	1,115	1,620	886	727	891	1,328
1991	Critical	1,511	1,739	1,492	1,169	1,366	2,329	1,425	1,457	911	739	855	1,071
1992	Critical	1,329	1,531	1,345	1,099	2,409	1,895	1,111	885	593	575	639	985
1993	Above Normal	1,060	1,305	1,392	4,683	3,535	2,987	2,496	2,493	6,864	4,238	2,258	2,564
1994	Critical	2,424	2,201	1,746	1,373	2,153	1,563	1,563	1,815	909	736	839	1,170
1995	Wet	1,285	1,521	1,407	3,700	4,211	19,468	13,194	23,061	14,170	19,419	4,666	2,887
1996	Wet	2,925	2,710	2,322	2,763	11,580	11,311	6,874	8,287	6,141	2,430	2,515	2,675
1997	Wet	2,912	3,728	21,248	60,094	22,931	9,048	5,239	5,262	2,517	1,793	1,930	2,435
1998	Wet	2,743	2,116	2,159	4,264	24,273	14,565	14,384	16,762	20,960	20,173	5,587	4,855
1999	Wet	4,757	3,396	3,223	5,095	11,663	6,655	6,112	5,332	3,205	1,790	1,954	2,297
2000	Above Normal	2,560	2,256	1,857	2,336	9,240	7,522	5,864	5,333	3,257	1,643	1,860	2,477
2001	Dry	2,855	2,572	2,284	2,393	2,415	3,602	3,291	3,063	1,420	1,182	1,358	1,798
2002	Dry	1,877	1,928	2,128	2,455	2,041	2,064	2,267	2,430	1,218	1,099	1,288	1,661
2003	Above Normal	1,544	1,692	1,912	1,627	1,985	1,923	3,067	3,086	1,336	1,234	1,407	1,691
Average		2,484	2,555	3,366	4,794	6,452	6,324	6,054	6,010	4,628	3,255	2,113	2,366
Wet		2,911	3,297	5,312	9,288	11,628	12,374	10,629	10,969	9,573	6,754	3,350	4,333
Above Normal		2,099	2,104	3,136	4,425	6,371	5,784	5,929	5,339	4,941	2,780	2,010	2,294
Below Normal		2,428	2,333	2,823	2,963	5,783	4,541	5,242	5,031	2,319	1,753	1,826	2,077
Dry		2,417	2,308	2,171	2,								

San Joaquin River Restoration Program

**Table 146: Simulated San Joaquin River Inflows to Delta (cfs) - Proposed Action**

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	1,980	2,236	2,774	2,527	5,683	5,644	7,521	7,067	13,563	5,102	2,494	2,497
1923	Below Normal	2,641	2,685	4,104	5,798	5,093	3,324	7,874	5,586	3,172	2,199	2,378	2,744
1924	Critical	2,913	2,437	2,163	1,904	2,077	2,108	1,707	1,631	1,021	971	1,123	1,489
1925	Dry	1,798	2,159	1,949	1,658	2,844	3,171	5,876	5,354	2,209	1,540	1,478	1,900
1926	Dry	2,203	2,363	2,052	1,847	2,255	2,450	4,233	3,258	1,525	1,257	1,387	1,861
1927	Wet	2,031	2,539	2,111	2,005	4,024	3,925	6,140	5,238	2,345	1,845	1,772	2,194
1928	Above Normal	2,777	2,956	2,456	2,463	2,743	6,505	5,981	4,149	1,816	1,515	1,522	1,957
1929	Critical	2,319	2,392	2,033	1,945	2,237	2,417	2,584	2,378	1,407	1,156	1,276	1,776
1930	Dry	1,891	2,150	1,727	1,643	2,185	2,597	2,489	2,369	1,314	1,202	1,318	1,830
1931	Critical	1,846	1,957	1,810	1,653	2,049	1,936	1,315	1,424	1,053	1,054	1,111	1,508
1932	Dry	1,715	1,944	2,793	2,139	4,753	3,429	4,603	4,262	2,128	2,037	1,645	1,984
1933	Critical	2,360	2,335	1,888	1,882	2,152	2,544	2,967	2,519	1,523	1,245	1,350	1,708
1934	Critical	2,015	2,090	1,947	1,811	2,205	2,165	1,710	1,648	1,164	978	1,093	1,495
1935	Below Normal	1,768	2,067	1,884	2,477	2,381	3,506	6,746	5,212	2,541	1,988	1,673	2,067
1936	Below Normal	2,468	2,422	2,050	2,141	9,546	7,881	8,125	5,632	2,642	2,056	2,393	2,464
1937	Below Normal	2,840	2,552	2,281	2,940	13,755	11,064	9,284	8,558	3,110	2,337	1,935	2,482
1938	Wet	2,641	2,824	6,740	5,883	22,167	28,994	16,732	21,629	20,811	9,893	4,422	4,381
1939	Dry	4,030	3,135	2,471	2,438	3,078	3,899	4,010	3,482	1,501	1,310	1,453	2,002
1940	Above Normal	2,280	2,269	1,898	3,318	4,106	7,903	9,015	5,999	2,947	1,847	1,798	2,423
1941	Wet	2,657	2,607	4,137	4,659	14,099	12,479	11,149	11,348	8,519	6,348	2,872	2,630
1942	Wet	3,066	3,176	4,018	7,917	9,671	6,969	9,419	9,382	8,461	7,060	4,150	4,179
1943	Wet	3,183	3,265	3,240	10,763	9,740	19,063	9,330	6,240	5,273	2,602	2,569	2,489
1944	Dry	2,900	2,985	2,534	2,405	3,242	3,918	5,537	3,869	2,119	1,542	1,550	1,876
1945	Below Normal	2,375	2,588	2,241	2,389	8,597	8,936	6,795	5,714	2,959	2,970	2,707	2,562
1946	Below Normal	3,189	2,830	7,585	5,838	6,048	6,118	6,219	5,812	3,042	1,793	1,790	2,354
1947	Dry	2,917	2,831	3,233	2,694	3,089	2,498	3,690	3,067	1,525	1,174	1,347	1,785
1948	Below Normal	2,155	2,247	1,877	1,710	1,991	2,328	3,924	3,246	2,242	1,741	1,514	1,841
1949	Dry	2,206	2,305	1,909	1,767	2,208	3,175	3,051	2,590	1,873	1,324	1,427	1,770
1950	Below Normal	2,074	2,312	1,992	2,063	2,418	2,891	4,586	3,689	2,391	1,413	1,443	1,873
1951	Above Normal	2,159	2,890	12,281	12,946	9,799	16,761	6,254	4,959	2,388	1,504	1,484	1,828
1952	Wet	2,248	2,353	2,577	6,295	4,636	12,757	12,003	16,319	15,166	9,226	4,464	4,119
1953	Wet	2,762	2,803	2,509	4,212	4,468	2,846	5,636	5,156	2,306	1,872	1,574	1,918
1954	Above Normal	2,339	2,331	2,001	1,895	2,320	2,929	4,251	3,727	1,909	1,388	1,444	1,796
1955	Dry	2,097	2,172	2,087	2,531	2,199	2,542	3,103	2,570	1,519	1,239	1,339	1,731
1956	Wet	1,901	2,092	6,652	19,431	11,319	7,219	6,732	7,558	10,095	6,234	2,959	3,743
1957	Above Normal	2,978	2,687	2,248	2,135	2,481	2,875	5,661	5,002	2,277	1,531	1,570	1,959
1958	Wet	2,496	2,345	2,132	2,268	3,846	10,312	19,143	14,524	13,306	7,135	4,340	4,234
1959	Below Normal	2,929	2,711	2,462	2,420	3,768	3,631	4,577	3,489	1,450	1,218	1,353	1,952
1960	Dry	2,094	2,107	1,781	1,678	2,532	2,254	2,504	2,384	1,251	973	1,152	1,548
1961	Dry	1,529	1,771	1,750	1,479	1,997	2,095	1,461	1,532	1,068	828	961	1,370
1962	Below Normal	1,499	1,888	1,727	1,313	5,282	4,323	5,253	4,453	1,833	1,512	1,520	1,865
1963	Wet	2,096	2,002	1,778	1,971	3,143	3,184	5,923	4,754	2,633	1,903	1,720	2,120
1964	Dry	2,423	2,528	2,038	2,186	2,170	2,313	2,553	2,437	1,447	1,198	1,265	1,696
1965	Wet	1,970	2,100	2,917	7,955	6,368	5,958	8,502	5,335	2,947	1,921	3,185	2,912
1966	Below Normal	2,723	3,571	4,710	4,276	4,767	3,450	4,556	3,527	1,447	1,251	1,276	1,626
1967	Wet	1,981	1,960	2,742	2,830	2,694	5,401	15,547	14,412	15,432	16,584	4,788	4,590
1968	Below Normal	3,246	2,533	2,276	2,353	3,301	3,187	4,226	3,801	1,555	1,319	1,446	1,815
1969	Wet	2,090	2,201	2,099	8,265	26,131	20,291	20,878	26,311	24,029	9,824	4,224	4,067
1970	Wet	4,195	3,153	3,521	16,774	8,739	7,897	5,889	4,480	2,216	1,844	1,520	2,061
1971	Wet	2,683	2,377	2,246	2,534	2,580	3,555	5,770	4,936	2,108	1,628	1,478	1,875
1972	Below Normal	2,734	2,216	2,095	1,701	2,250	2,319	3,730	3,079	1,451	1,292	1,379	1,625
1973	Above Normal	2,004	2,319	2,058	2,226	5,023	5,162	6,340	5,195	3,334	1,932	2,458	2,553
1974	Wet	3,109	3,105	4,572	5,952	4,678	8,408	7,587	5,817	6,327	3,311	2,752	3,027
1975	Wet	3,928	3,367	2,758	2,525	7,598	8,626	6,999	5,002	7,754	3,617	2,820	2,612
1976	Critical	3,689	3,026	2,234	2,171	2,435	2,437	2,486	2,364	1,240	1,186	1,464	1,601
1977	Critical	1,755	1,768	1,655	1,491	1,763	1,277	1,542	1,697	745	630	697	991
1978	Above Normal	1,237	1,553	1,568	3,001	6,253	8,025	11,577	11,006	11,116	4,290	2,819	3,302
1979	Below Normal	2,413	3,119	2,492	4,070	8,152	9,520	6,728	9,008	3,256	1,704	2,391	2,334
1980	Above Normal	2,967	2,783	2,349	11,174	21,712	15,240	6,950	7,383	11,842	7,200	3,096	2,709
1981	Dry	3,353	3,173	2,333	2,416	2,651	3,510	4,819	3,914	1,551	1,446	1,381	1,761
1982	Wet	2,355	2,258	2,215	3,320	16,045	15,859	27,106	17,419	11,790	8,299	4,688	7,525
1983	Wet	7,609	10,055	20,283	26,162	32,102	48,974	22,328	24,805	28,033	24,303	9,153	7,969
1984	Wet	5,217	16,043	23,205	14,755	10,030	7,810	6,607	5,443	2,940	2,046	2,311	3,178
1985	Dry	4,003	3,275	2,127	2,360	3,151	3,361	3,964	3,344	1,572	1,490	1,668	2,080
1986	Wet	2,433	2,608	2,268	1,934	16,104	27,496	11,554	10,868	9,598	2,844	2,832	3,356
1987	Dry	3,837	3,707	2,358	2,087	2,254	3,290	2,436	2,316	1,283	1,083	1,256	1,672
1988	Critical	1,908	2,087	1,782	1,650	1,937	1,830	1,831	1,734	1,093	779	969	1,393
1989	Dry	1,281	1,866	1,679	1,392	1,827	2,121	2,216	1,538	971	861	1,076	1,792
1990	Critical	1,652	1,921	1,627	1,352	2,033	1,786	1,243	1,679	966	733	897	1,353
1991	Critical	1,586	1,961	1,497	1,172	1,509	3,065	1,881	1,522	996	746	861	1,096
1992	Critical	1,405	1,755	1,351	1,103	2,544	2,203	1,222	1,141	676	583	646	1,010
1993	Above Normal	1,136	1,530	1,398	4,683	3,679	3,723	3,661	3,670	8,861	4,241	2,262	2,587
1994	Critical	2,500	2,426	1,753	1,377	2,188	1,943	1,645	1,881	1,070	734	844	1,194
1995	Wet	1,362	1,748	1,416	3,689	3,108	20,225	12,538	21,155	14,515	19,437	4,681	2,920
1996	Wet	3,015	2,937	2,331	2,772	12,637	11,560	7,956	7,570	6,185	2,436	2,521	2,700
1997	Wet	2,985	3,880	19,081	59,612	22,508	9,780	5,829	6,071	3,780	1,799	1,979	2,888
1998	Wet	2,836	2,377	2,208	4,238	22,438	14,933	14,068	15,441	18,636	20,182	5,593	4,879
1999	Wet	4,829	3,614	3,223	5,095	11,803	7,387	6,712	5,354	3,205	1,796	1,960	2,322
2000	Above Normal	2,633	2,505	1,888	2,336	9,960	8,395	6,469	5,709	3,411	1,650	1,867	2,593
2001	Dry	2,952	2,821	2,315	2,394	2,555	4,284	3,831	3,086	1,472	1,194	1,364	1,823
2002	Dry	1,948	2,155	2,136	2,453	2,080	2,597	2,769	2,457	1,281	1,114	1,297	1,686
2003	Above Normal	1,620	1,912	1,913	1,631	2,024	2,376	4,242	3,706	1,396	1,241	1,414	1,716
	Average	2,561	2,745	3,276	4,667	6,317	6,819	6,511	6,054	4,719	3,266	2,121	2,405
	Wet	2,988	3,453	5,114	8,993	11,257	12,766	11,080	10,868	9,554	6,769	3,359	3,496
	Above Normal	2,176	2,331	2,903	4,194	6,315	6,295	6,494	5,631	5,405	2,787	2,019	2,327
	Below Normal	2,504	2,553	2,841	2,963	5,525	5,177	5,902	5,058	2,364	1,771	1,833	2,115

Table 147: Simulated Delta Outflow (cfs) - No-Action Alternativ

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	4,247	4,500	9,543	7,951	32,287	23,725	22,906	51,947	37,493	8,000	4,000	4,102
1923	Below Normal	4,676	5,173	25,322	26,300	13,444	11,289	22,175	15,627	8,378	8,073	4,196	4,483
1924	Critical	4,633	4,500	4,500	6,837	11,621	10,084	6,275	4,000	6,195	4,000	4,668	3,000
1925	Dry	3,036	4,428	5,962	6,000	66,147	27,195	20,080	13,198	8,682	5,000	3,916	3,000
1926	Dry	4,536	4,500	4,500	9,343	38,910	9,653	20,835	10,845	5,112	5,000	4,533	3,238
1927	Wet	4,000	12,729	9,017	29,209	123,160	39,496	46,363	23,078	10,135	12,087	4,000	4,125
1928	Above Normal	4,165	8,940	6,898	14,991	17,607	94,285	23,665	16,475	7,283	9,964	4,000	3,948
1929	Critical	4,049	4,995	5,632	5,377	9,715	9,565	6,956	6,588	6,034	4,000	4,397	3,000
1930	Dry	3,303	4,052	8,240	13,188	14,608	28,067	11,243	8,953	5,655	5,667	3,653	3,000
1931	Critical	4,376	4,500	4,500	6,109	7,779	6,201	6,828	4,000	6,245	4,000	4,442	3,000
1932	Dry	3,218	4,556	13,894	13,104	15,363	11,400	11,198	11,417	10,199	5,000	3,500	3,000
1933	Critical	4,688	4,500	4,500	8,774	7,223	9,958	10,049	5,730	6,046	4,000	4,236	3,000
1934	Critical	3,147	4,259	6,628	11,469	13,443	11,400	9,997	5,624	6,897	4,000	3,976	3,000
1935	Below Normal	3,491	4,634	5,083	23,707	11,400	21,632	50,906	26,956	10,328	8,036	4,000	3,000
1936	Below Normal	4,000	4,500	5,386	34,450	76,740	27,787	22,183	17,296	8,068	8,560	4,000	3,816
1937	Below Normal	4,000	4,500	4,854	8,462	47,272	49,234	24,948	16,520	10,088	6,500	4,000	3,499
1938	Wet	4,000	16,709	62,455	29,796	145,535	167,798	73,847	68,055	43,729	8,000	4,000	9,721
1939	Dry	8,400	4,809	5,171	5,849	9,184	11,962	10,018	8,798	5,890	7,453	3,582	3,000
1940	Above Normal	4,000	4,500	4,699	27,716	56,240	106,109	65,931	17,062	7,501	12,686	4,000	3,722
1941	Wet	4,000	4,636	36,955	93,365	118,361	88,424	71,763	41,153	15,099	8,000	4,000	7,518
1942	Wet	4,610	4,972	55,943	77,692	139,093	21,866	48,356	34,977	21,024	8,000	4,000	8,798
1943	Wet	4,434	9,047	22,917	83,513	54,972	90,185	27,921	19,346	7,367	9,391	4,000	3,453
1944	Dry	4,000	4,825	5,340	6,097	20,861	15,033	10,756	8,571	7,502	5,920	4,287	3,299
1945	Below Normal	4,000	6,303	8,893	6,000	51,179	26,550	12,372	11,660	9,160	7,786	4,000	3,846
1946	Below Normal	4,578	5,973	66,921	41,915	25,029	14,125	14,065	12,781	8,736	8,292	4,000	3,182
1947	Dry	4,000	4,500	8,203	6,000	12,520	15,300	11,196	8,810	6,306	7,093	3,500	3,000
1948	Below Normal	4,035	4,500	5,318	7,328	18,085	10,715	23,314	20,238	10,427	6,500	5,697	4,051
1949	Dry	4,000	4,500	5,731	5,768	21,623	32,661	10,572	11,802	7,550	5,000	5,157	3,000
1950	Below Normal	4,000	4,500	4,925	12,106	30,481	14,639	17,282	13,192	8,922	6,500	4,000	4,148
1951	Above Normal	4,023	45,833	104,642	72,127	70,942	26,254	14,169	14,192	8,963	11,821	4,000	4,090
1952	Wet	4,206	5,058	37,699	78,630	70,538	64,159	66,489	69,849	40,062	10,581	5,253	13,907
1953	Wet	5,349	4,977	37,047	93,768	22,226	14,629	14,680	21,322	16,140	8,000	4,000	7,027
1954	Above Normal	4,456	5,937	4,962	24,745	51,871	43,195	35,513	22,244	6,746	11,962	4,000	3,601
1955	Dry	4,000	5,419	16,040	12,066	11,400	8,448	9,506	9,035	7,138	5,641	4,125	3,000
1956	Wet	4,000	4,500	92,194	166,040	83,103	36,916	17,206	39,495	16,475	8,000	4,000	9,218
1957	Above Normal	5,460	4,500	4,869	7,418	26,658	38,647	18,847	14,177	9,232	9,769	4,000	3,741
1958	Wet	10,276	6,152	14,962	32,061	152,614	118,406	98,862	48,257	31,968	8,000	5,274	12,465
1959	Below Normal	6,590	4,760	4,817	27,062	43,893	21,152	9,039	7,962	8,585	9,135	4,000	3,155
1960	Dry	4,000	4,500	6,208	5,268	22,972	14,108	11,400	9,557	5,981	7,287	3,500	3,217
1961	Dry	4,622	4,500	7,420	6,072	22,752	12,818	10,171	7,937	6,191	6,227	5,318	3,000
1962	Below Normal	4,000	4,500	6,943	6,000	49,556	17,596	11,686	11,400	7,523	10,550	4,000	3,000
1963	Wet	28,325	6,265	19,349	9,581	61,767	26,688	85,874	25,224	10,991	12,836	4,000	4,281
1964	Dry	4,822	18,794	5,069	15,862	11,192	8,028	9,852	10,243	6,498	6,304	4,770	3,000
1965	Wet	4,000	5,959	74,654	110,693	29,040	18,625	45,200	22,968	7,773	10,160	4,000	3,991
1966	Below Normal	4,000	14,319	8,907	25,359	19,835	19,382	10,936	11,005	7,638	9,822	4,000	3,655
1967	Wet	4,258	5,569	28,326	42,595	47,606	53,820	52,390	51,530	44,141	15,648	4,458	13,629
1968	Below Normal	7,383	5,036	5,801	24,160	55,773	28,470	13,856	8,967	8,077	9,494	4,000	3,000
1969	Wet	4,000	5,051	15,478	112,764	135,803	62,335	56,296	62,217	36,196	8,000	4,000	10,775
1970	Wet	7,205	5,257	52,710	209,235	76,263	35,395	15,462	11,361	9,305	11,585	4,000	3,000
1971	Wet	4,000	10,901	53,047	42,164	25,830	30,610	20,905	25,372	11,237	11,243	4,000	7,557
1972	Below Normal	4,408	4,500	8,233	7,310	14,837	27,205	10,075	8,406	8,455	8,209	4,520	3,000
1973	Above Normal	4,000	12,365	17,956	80,330	85,975	51,980	15,269	14,240	10,735	10,392	4,000	4,156
1974	Wet	4,915	50,470	63,593	128,441	34,813	106,874	62,753	19,734	14,782	9,112	4,035	11,175
1975	Wet	4,956	4,831	8,046	8,715	61,342	84,559	22,032	26,682	18,041	8,000	4,000	10,201
1976	Critical	7,594	6,641	5,803	5,472	8,889	11,676	7,267	4,000	5,009	5,097	3,298	3,000
1977	Critical	4,493	3,500	5,877	4,500	6,965	6,139	7,100	4,000	4,553	4,434	4,051	3,000
1978	Above Normal	3,347	3,669	7,842	61,710	49,887	65,298	40,469	20,188	14,185	8,000	4,000	4,110
1979	Below Normal	4,236	4,792	5,466	16,638	33,550	31,381	16,112	15,140	10,641	6,500	4,000	3,336
1980	Above Normal	4,000	5,609	11,843	108,617	134,894	58,802	16,588	14,788	13,494	8,000	4,000	4,164
1981	Dry	4,000	4,500	5,774	19,220	19,674	21,557	11,936	7,380	7,145	6,411	3,683	3,000
1982	Wet	5,070	25,052	85,807	71,106	104,289	83,812	139,798	41,757	20,088	8,000	4,106	18,483
1983	Wet	17,684	41,630	82,614	103,109	176,832	256,364	85,437	75,469	71,427	34,232	17,206	22,713
1984	Wet	11,523	78,323	154,981	63,561	36,647	33,057	16,825	11,518	9,448	11,225	4,000	3,473
1985	Dry	5,111	23,591	13,332	6,352	9,655	10,838	10,528	10,197	6,450	6,596	4,543	3,771
1986	Wet	4,000	4,848	8,438	14,014	215,805	144,627	21,700	14,215	10,395	8,551	4,000	4,266
1987	Dry	4,000	4,500	4,967	7,061	12,997	22,292	10,795	8,215	6,529	6,635	3,822	3,000
1988	Critical	4,000	4,500	7,405	19,381	11,188	7,895	8,433	6,185	6,897	4,000	4,382	3,000
1989	Dry	3,295	4,947	3,693	8,584	7,856	42,442	16,935	10,318	6,526	6,965	4,602	3,000
1990	Critical	4,000	4,500	6,456	9,643	11,400	7,763	9,869	4,479	4,000	5,352	4,019	3,000
1991	Critical	3,387	4,065	4,051	4,759	6,632	23,392	11,192	4,219	4,000	4,725	4,524	3,000
1992	Critical	3,000	4,969	3,500	6,770	24,706	14,022	10,367	5,775	6,732	4,000	3,352	3,000
1993	Above Normal	4,213	3,500	6,423	61,822	53,619	27,467	32,016	25,250	20,774	8,000	4,000	3,875
1994	Critical	4,415	4,500	5,652	6,198	13,882	11,018	9,691	7,085	6,140	4,376	6,663	3,000
1995	Wet	3,000	5,440	5,556	111,442	41,860	211,396	62,017	84,839	41,429	23,150	7,948	13,532
1996	Wet	5,410	4,731	18,510	41,427	126,142	71,870	39,227	44,627	13,369	8,000	4,151	7,955
1997	Wet	4,000	8,864	101,258	280,005	73,496	22,439	14,684	11,468	7,906	9,883	4,000	3,000
1998	Wet	4,000	5,201	11,329	66,371	230,034	85,026	57,794	54,186	74,785	28,171	12,129	19,768
1999	Wet	9,548	20,436	27,660	36,173	95,078	58,727	24,768	18,746	10,374	9,938	4,000	6,216
2000	Above Normal	4,000	5,272	4,500	25,007	113,352	61,288	17,468	15,169	8,017	11,173	4,000	3,875
2001	Dry	4,795	4,500	7,481	9,272	17,106	18,242	10,824	7,605	6,079	6,050	3,866	3,000
2002	Dry	4,000	4,870	25,239	42,763	26,239	16,569	13,344	10,527	6,789	6,573	5,081	3,000
2003	Above Normal	4,000	8,902	27,730	51,694	26,081	15,852	22,860	34,713	10,326	10,603	4,000	3,927
Average		5,037	8,791	21,660	39,507	51,064	41,682	26,811	20,246	13,225	8,597	4,46	

San Joaquin River Restoration Program

Table 148: Simulated Delta Outflow (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	4,286	4,500	9,543	7,951	32,387	24,440	22,856	51,901	37,537	8,000	4,000	4,102
1923	Below Normal	4,715	5,173	25,280	26,483	13,540	11,337	23,002	15,637	8,352	7,971	4,317	4,491
1924	Critical	4,585	4,500	4,500	6,849	11,571	10,085	6,273	4,000	6,201	4,000	4,678	3,000
1925	Dry	3,053	4,802	5,616	6,000	66,288	27,195	20,530	13,168	8,681	5,000	3,895	3,000
1926	Dry	4,580	4,500	4,500	9,359	38,991	9,644	21,572	10,722	5,112	5,214	4,398	3,265
1927	Wet	4,000	12,937	9,009	28,849	124,073	40,216	46,801	23,081	10,175	12,083	4,000	4,125
1928	Above Normal	4,184	9,200	6,926	14,998	17,694	95,149	24,367	16,457	7,270	9,975	4,000	3,893
1929	Critical	4,111	4,918	5,742	5,380	9,693	9,565	6,956	6,589	6,034	4,000	4,399	3,000
1930	Dry	3,329	4,090	8,162	13,189	14,642	28,639	11,259	8,957	5,649	5,626	3,666	3,000
1931	Critical	4,358	4,500	4,500	6,107	7,779	6,201	6,828	4,000	6,309	4,000	4,425	3,000
1932	Dry	3,259	4,576	13,906	13,111	15,796	11,400	11,198	11,836	10,194	5,000	3,500	3,000
1933	Critical	4,702	4,500	4,500	9,147	7,203	10,097	10,047	5,727	6,046	4,000	4,250	3,000
1934	Critical	3,185	4,335	6,461	12,446	13,474	11,400	9,996	5,619	6,897	4,000	3,967	3,000
1935	Below Normal	3,531	4,941	4,380	23,716	11,400	22,688	51,726	26,696	10,399	8,042	4,000	3,275
1936	Below Normal	4,000	4,500	5,131	34,408	75,254	28,620	22,427	17,287	8,058	8,797	4,000	3,815
1937	Below Normal	4,000	4,500	4,730	7,550	45,603	48,737	24,964	16,526	10,098	6,500	4,000	3,000
1938	Wet	4,000	17,445	61,525	29,593	143,663	167,497	72,227	67,669	43,343	8,000	4,000	9,878
1939	Dry	8,470	4,809	5,171	5,808	9,263	12,438	10,012	8,834	5,895	7,390	3,580	3,000
1940	Above Normal	4,000	4,500	4,600	27,725	56,553	106,860	66,039	17,042	7,504	12,694	4,000	4,093
1941	Wet	4,165	4,500	35,339	92,652	116,715	88,577	70,982	42,492	15,005	8,000	4,000	7,541
1942	Wet	4,611	4,973	57,968	76,334	136,141	22,439	48,613	35,014	21,073	8,000	4,000	8,803
1943	Wet	4,445	9,288	22,914	81,307	53,575	87,461	27,923	19,417	7,402	9,297	4,000	3,590
1944	Dry	4,402	4,500	5,504	6,158	20,379	15,506	11,260	8,627	7,493	5,866	4,008	3,000
1945	Below Normal	4,000	6,511	8,887	6,000	49,844	26,553	12,158	11,678	9,162	7,771	4,000	3,845
1946	Below Normal	4,663	6,247	67,099	41,912	24,980	14,829	14,260	12,800	8,733	8,258	4,041	3,205
1947	Dry	4,000	4,500	8,238	6,000	12,507	15,504	11,195	8,860	6,353	6,880	3,500	3,000
1948	Below Normal	4,071	4,500	4,579	7,585	17,718	11,055	23,818	20,217	11,096	6,500	5,653	3,898
1949	Dry	4,000	4,500	6,466	4,867	8,838	35,919	11,186	11,866	7,549	5,000	5,161	3,000
1950	Below Normal	4,000	4,500	4,844	12,114	29,581	14,944	17,653	13,624	8,913	6,500	4,000	4,169
1951	Above Normal	4,110	47,366	101,978	71,073	70,707	26,982	14,102	13,941	9,083	11,740	4,000	4,091
1952	Wet	4,250	4,985	37,966	78,725	70,856	63,877	66,637	68,292	39,545	10,587	5,260	13,931
1953	Wet	5,422	4,977	37,049	93,979	22,207	14,998	14,812	21,330	16,172	8,000	4,000	7,537
1954	Above Normal	4,459	6,185	4,968	25,172	51,892	43,405	36,130	22,116	6,770	11,955	4,000	3,614
1955	Dry	4,000	5,717	16,040	12,072	11,400	8,812	9,585	8,937	7,140	5,132	4,028	3,000
1956	Wet	4,000	4,500	91,494	165,265	82,954	37,444	17,164	40,535	18,051	8,000	4,000	9,940
1957	Above Normal	6,481	4,500	4,830	7,178	26,902	38,259	18,852	14,722	9,141	9,875	4,000	3,755
1958	Wet	10,346	6,372	14,964	32,339	152,727	117,828	99,235	49,052	31,800	8,000	5,281	12,496
1959	Below Normal	6,663	4,760	4,933	27,060	44,011	21,151	9,395	8,010	8,450	9,239	4,000	3,162
1960	Dry	4,000	4,500	6,127	5,264	23,057	14,464	11,400	9,571	5,990	7,330	3,500	3,211
1961	Dry	4,608	4,500	7,420	6,071	23,081	13,063	10,169	7,991	6,190	6,360	5,168	3,000
1962	Below Normal	4,000	4,500	6,891	6,000	49,678	18,072	12,245	11,400	7,462	10,483	4,000	3,000
1963	Wet	27,946	6,462	19,324	9,584	62,474	26,584	86,670	25,598	10,973	12,845	4,000	4,279
1964	Dry	4,818	19,414	5,069	15,897	11,191	8,343	9,618	10,364	6,485	6,331	4,748	3,000
1965	Wet	4,000	6,182	74,688	110,216	28,698	18,683	45,129	22,980	7,746	10,136	4,000	3,968
1966	Below Normal	4,000	14,440	9,014	25,064	19,941	18,837	11,487	11,003	7,627	9,832	4,000	3,672
1967	Wet	4,294	5,797	28,104	42,847	47,872	53,625	51,871	51,439	42,507	15,949	4,466	13,654
1968	Below Normal	7,456	5,254	5,803	24,161	55,891	29,203	13,839	9,025	8,038	9,551	4,000	3,000
1969	Wet	4,000	5,081	15,477	111,394	134,079	61,623	56,369	62,750	34,173	8,000	4,000	10,802
1970	Wet	7,278	5,473	52,710	208,872	76,416	36,116	15,388	11,417	9,374	11,598	4,000	3,000
1971	Wet	4,000	11,119	53,986	42,153	25,767	32,412	20,947	25,418	11,237	11,259	4,000	7,558
1972	Below Normal	4,415	4,623	8,230	7,310	14,797	26,783	10,458	8,404	8,394	8,191	4,560	3,000
1973	Above Normal	4,000	12,099	17,779	80,491	86,090	53,087	15,566	15,074	10,515	10,397	4,000	3,639
1974	Wet	4,824	52,547	63,928	127,511	34,934	106,530	63,396	19,820	14,863	9,055	4,040	11,273
1975	Wet	5,138	4,831	8,082	8,514	61,624	84,155	22,316	26,756	18,551	8,000	4,000	10,218
1976	Critical	7,600	6,870	5,834	5,472	8,890	12,032	7,255	4,000	4,949	5,232	3,208	3,000
1977	Critical	4,548	3,500	5,726	4,500	6,969	6,140	7,100	4,000	4,551	4,436	4,054	3,000
1978	Above Normal	3,372	3,673	7,811	61,714	48,464	64,831	39,103	20,375	15,047	8,000	4,000	3,109
1979	Below Normal	4,234	4,791	5,637	16,637	33,198	31,155	16,232	15,513	10,556	6,500	4,000	3,366
1980	Above Normal	4,000	5,869	11,885	107,443	133,502	58,181	16,477	15,153	14,931	8,000	4,000	4,164
1981	Dry	4,000	4,500	5,888	19,886	19,789	21,252	12,420	7,341	7,166	6,338	3,763	3,000
1982	Wet	5,041	25,172	86,086	70,932	103,157	83,022	139,630	40,390	20,739	8,000	4,112	18,514
1983	Wet	17,757	40,666	82,008	102,765	172,865	256,925	85,294	74,977	70,952	34,227	17,213	22,737
1984	Wet	11,608	77,973	154,078	62,966	36,738	33,773	16,742	11,531	9,500	11,152	4,000	3,535
1985	Dry	5,425	24,020	13,647	6,348	9,785	11,290	11,012	10,148	6,453	6,565	4,610	3,772
1986	Wet	4,000	4,828	8,450	13,931	214,519	143,982	21,495	13,837	10,978	8,217	4,000	4,421
1987	Dry	4,000	4,500	4,909	6,995	13,314	23,195	10,635	8,313	6,496	6,695	3,796	3,000
1988	Critical	4,000	4,500	7,437	19,374	11,188	7,895	8,467	6,177	6,897	4,000	4,351	3,000
1989	Dry	3,359	4,878	3,755	8,403	7,862	42,869	17,361	10,227	6,422	7,039	4,434	3,000
1990	Critical	4,000	4,500	6,654	9,636	11,400	8,009	9,864	4,513	4,000	5,363	4,003	3,000
1991	Critical	3,405	4,167	3,832	5,107	6,597	24,009	11,192	4,686	4,000	4,297	4,827	3,000
1992	Critical	3,000	4,957	3,500	6,773	24,792	14,248	10,365	5,772	6,729	4,000	3,351	3,000
1993	Above Normal	4,263	3,500	6,404	62,186	53,721	28,147	33,109	26,647	22,747	8,000	4,000	3,870
1994	Critical	4,462	4,500	6,332	5,473	13,912	11,019	9,727	7,104	5,739	4,817	5,315	3,000
1995	Wet	3,237	5,961	5,383	109,533	43,116	212,218	62,281	82,937	41,777	23,172	7,965	13,568
1996	Wet	5,503	4,731	18,525	41,656	126,557	71,669	39,996	44,086	13,383	8,000	4,114	7,983
1997	Wet	4,000	9,041	99,103	279,528	73,003	22,120	14,490	11,908	7,980	9,604	4,000	3,000
1998	Wet	4,000	5,276	11,381	68,067	227,794	85,397	57,481	53,027	72,463	28,182	12,137	19,794
1999	Wet	9,623	20,655	27,661	36,175	94,974	59,461	25,055	18,757	10,360	9,905	4,000	6,279
2000	Above Normal	4,004	5,557	4,637	24,862	114,083	62,014	17,396	15,168	8,023	11,140	4,000	3,875
2001	Dry	4,783	4,500	6,964	9,260	17,184	18,681	10,746	7,634	6,071	6,055	3,564	3,000
2002	Dry	4,088	4,820	25,968	43,230	26,236	16,565	13,738	10,532	6,791	6,535	5,254	3,000
2003	Above Normal	4,000	9,118	27,401	51,569	26,111	15,852	23,712	35,102	10,308	10,585	4,000	3,965
Average		5,080	8,908	21,583	39,369	50,660	41,894	26,942	20,270	13,230	8,589	4,446	5

Table 149: Simulated Exports Through Banks and Jones Pumping Plants (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	10,408	7,716	11,414	11,708	12,753	10,540	7,323	6,975	9,330	11,260	11,216	11,152
1923	Below Normal	10,830	10,933	11,637	11,748	7,474	6,705	7,483	5,494	6,606	11,246	11,206	11,147
1924	Critical	11,021	7,734	8,058	7,455	4,646	1,108	1,495	2,534	5,401	2,751	1,500	4,621
1925	Dry	5,342	3,986	9,968	9,044	9,996	1,100	6,936	5,703	3,085	5,844	7,445	8,255
1926	Dry	5,667	6,258	5,884	11,509	10,189	5,896	6,424	3,067	3,581	5,524	7,480	9,594
1927	Wet	5,954	10,900	11,269	7,721	7,286	9,255	7,234	5,638	7,727	9,964	11,198	11,142
1928	Above Normal	9,831	10,927	11,339	11,722	11,030	10,601	7,284	3,953	6,429	5,090	11,204	10,779
1929	Critical	10,118	9,597	8,797	9,695	8,110	3,664	2,372	1,346	1,100	4,752	1,500	4,876
1930	Dry	4,991	4,154	10,586	11,439	8,264	7,550	2,917	2,943	2,438	7,707	5,856	7,791
1931	Critical	5,453	5,158	4,468	9,710	5,505	2,772	1,100	1,538	1,521	6,382	1,500	4,631
1932	Dry	4,864	3,549	11,384	11,606	8,428	4,774	1,608	3,508	1,665	3,512	7,619	9,514
1933	Critical	5,460	5,294	5,923	8,466	6,068	5,619	2,136	2,817	1,100	1,504	1,631	4,789
1934	Critical	5,317	3,897	9,322	10,449	6,899	1,625	1,100	1,100	1,590	2,386	1,823	4,556
1935	Below Normal	4,754	7,333	6,242	11,718	6,319	8,785	6,568	4,974	6,640	10,400	7,226	8,907
1936	Below Normal	7,583	7,069	7,845	11,611	9,698	9,772	6,662	5,262	5,965	10,302	7,955	10,780
1937	Below Normal	8,441	6,907	7,878	9,173	9,718	7,127	7,092	6,074	4,538	5,898	7,169	10,130
1938	Wet	7,012	10,909	10,771	7,077	7,391	8,544	8,713	10,143	9,680	11,280	11,251	11,170
1939	Dry	11,067	10,944	11,342	10,371	7,656	6,653	1,369	4,396	5,842	10,744	2,699	5,232
1940	Above Normal	7,320	7,007	7,827	12,006	12,198	11,838	7,755	5,800	6,775	7,758	11,195	10,463
1941	Wet	9,311	9,251	11,640	12,461	12,742	11,057	7,744	8,657	7,705	11,264	11,220	11,154
1942	Wet	11,035	10,934	11,622	11,036	8,804	9,426	7,849	8,040	9,525	11,254	11,212	11,150
1943	Wet	11,027	10,931	11,478	11,728	10,353	8,300	7,675	5,636	5,897	7,622	10,510	10,161
1944	Dry	9,620	9,265	9,456	10,755	10,670	8,642	4,302	4,330	6,375	10,992	8,102	9,887
1945	Below Normal	7,702	10,913	11,306	9,392	9,695	4,419	5,491	5,509	7,443	11,243	11,204	11,145
1946	Below Normal	10,514	10,928	11,900	12,726	3,812	8,013	5,095	5,253	6,471	11,204	10,193	9,537
1947	Dry	9,132	9,088	11,480	8,676	10,209	8,437	2,079	3,551	5,808	11,182	7,061	4,942
1948	Below Normal	7,534	8,795	5,732	11,469	6,322	5,993	6,347	5,373	7,794	9,273	11,198	11,117
1949	Dry	9,513	7,135	9,640	8,086	1,500	11,309	3,758	1,790	2,775	9,837	9,335	8,222
1950	Below Normal	5,985	7,519	5,805	11,589	10,039	7,681	6,506	3,948	6,167	7,766	7,685	11,053
1951	Above Normal	9,577	10,910	11,349	7,306	7,771	9,233	6,081	5,719	6,962	8,608	11,205	11,146
1952	Wet	10,192	10,359	11,359	12,726	12,314	10,814	8,610	9,854	9,680	11,280	11,251	11,170
1953	Wet	11,067	10,944	11,349	11,545	7,070	8,369	5,732	6,800	8,424	10,232	9,383	11,146
1954	Above Normal	11,017	10,929	10,981	11,107	11,288	9,877	6,815	4,659	6,024	7,254	10,083	10,182
1955	Dry	9,066	10,927	11,285	11,747	7,296	5,095	3,457	3,873	2,668	9,506	3,032	7,048
1956	Wet	5,733	8,249	11,893	11,421	10,028	8,235	6,653	7,014	9,680	11,255	10,068	11,150
1957	Above Normal	11,028	9,927	10,828	8,112	11,741	10,345	1,352	5,539	6,762	6,569	11,192	10,194
1958	Wet	11,006	10,925	11,287	11,122	11,427	8,874	8,319	9,373	9,680	11,280	11,251	11,170
1959	Below Normal	11,067	10,944	10,740	10,722	11,534	2,755	3,842	4,317	6,779	9,092	6,405	7,586
1960	Dry	8,354	8,142	7,806	9,284	11,687	8,069	1,100	2,683	5,479	10,504	7,705	9,509
1961	Dry	5,070	9,424	10,552	9,052	9,033	7,083	1,593	3,247	6,000	7,543	10,650	6,703
1962	Below Normal	5,568	5,765	10,421	5,822	12,634	9,780	4,970	5,128	6,438	10,409	10,610	8,429
1963	Wet	10,985	10,918	11,219	11,558	11,938	7,279	7,551	6,878	6,905	9,568	11,194	11,140
1964	Dry	11,009	10,925	11,267	11,630	6,379	4,921	1,824	2,853	5,388	11,176	9,935	6,185
1965	Wet	7,087	10,912	11,420	12,720	11,263	6,177	7,604	4,912	6,170	7,355	11,057	10,667
1966	Below Normal	8,993	10,925	11,751	11,520	10,605	9,529	4,542	3,719	6,400	10,071	11,197	10,088
1967	Wet	10,605	10,926	11,401	11,846	11,392	10,786	8,672	9,481	9,680	11,280	11,251	11,170
1968	Below Normal	11,067	10,944	11,306	11,219	10,439	9,166	1,689	4,420	6,964	9,728	10,604	7,774
1969	Wet	8,805	9,183	11,285	12,725	11,857	9,448	8,832	10,151	9,680	11,280	11,251	11,170
1970	Wet	11,067	10,944	11,533	11,625	9,093	9,114	5,869	4,276	6,549	9,226	10,428	8,950
1971	Wet	8,938	10,928	11,312	11,750	10,001	11,410	6,880	6,591	8,422	10,385	11,189	11,138
1972	Below Normal	11,003	9,992	11,283	11,471	8,868	10,261	3,850	4,175	6,741	7,946	10,507	8,439
1973	Above Normal	7,126	10,924	11,267	10,880	11,573	9,910	5,876	4,322	6,448	10,411	11,201	11,144
1974	Wet	11,015	10,927	11,727	12,419	11,719	9,213	7,760	6,068	7,512	11,264	11,220	11,154
1975	Wet	11,035	10,934	11,392	10,754	11,843	10,143	7,190	6,125	9,680	11,238	11,200	11,143
1976	Critical	11,014	10,927	11,304	10,744	7,717	7,111	3,062	2,467	5,078	8,598	6,203	4,732
1977	Critical	4,747	6,499	3,939	5,396	2,703	1,515	1,100	1,272	2,082	1,723	3,378	4,242
1978	Above Normal	4,191	4,111	8,834	11,893	11,754	9,654	8,474	8,584	7,678	11,280	11,251	11,170
1979	Below Normal	11,066	10,081	8,624	12,266	12,161	9,668	5,725	6,914	6,932	10,032	8,839	10,171
1980	Above Normal	9,160	10,926	11,313	12,671	8,941	8,349	7,302	5,147	6,940	9,261	8,406	11,157
1981	Dry	9,389	8,170	10,341	11,714	10,859	9,535	4,539	4,322	6,469	11,033	7,692	8,816
1982	Wet	9,921	10,929	11,307	12,001	11,848	9,961	8,525	9,936	9,680	11,280	11,251	11,170
1983	Wet	11,067	10,944	11,905	11,752	9,894	8,676	8,857	10,141	9,680	11,280	11,251	11,170
1984	Wet	11,067	10,944	11,085	8,521	9,484	9,289	4,534	3,758	6,265	10,303	11,185	10,314
1985	Dry	11,000	10,922	11,279	11,463	8,155	5,737	4,116	4,490	6,124	11,224	11,189	9,849
1986	Wet	8,627	8,986	11,300	11,549	12,741	10,410	8,097	8,390	5,986	7,313	10,009	10,865
1987	Dry	10,144	9,196	7,927	9,050	8,486	8,091	1,100	3,957	5,927	10,718	3,216	4,677
1988	Critical	6,278	5,868	11,206	11,449	2,103	1,549	3,067	1,686	4,463	8,886	1,500	4,370
1989	Dry	4,236	5,114	6,741	6,091	2,182	10,715	4,789	2,698	5,970	11,150	10,852	7,723
1990	Critical	7,769	7,303	7,761	11,350	3,236	4,827	1,100	2,376	4,344	4,818	1,500	4,350
1991	Critical	4,523	3,883	3,265	2,798	2,844	11,291	1,610	2,430	1,769	5,629	2,183	4,014
1992	Critical	4,886	2,807	4,315	4,875	11,681	7,608	1,983	1,100	2,814	2,936	4,753	5,000
1993	Above Normal	3,855	4,009	7,839	12,459	12,089	11,197	6,512	5,036	9,155	11,229	10,861	11,140
1994	Critical	10,908	7,188	9,668	9,086	10,732	4,389	2,696	3,205	5,856	11,245	11,076	6,886
1995	Wet	6,372	4,085	10,551	12,139	12,327	11,425	9,588	10,136	9,680	11,280	11,251	11,170
1996	Wet	11,067	10,944	11,314	11,288	9,893	8,193	7,859	6,953	7,016	7,840	9,830	11,153
1997	Wet	8,218	10,933	11,901	11,729	11,788	8,023	5,256	3,758	5,947	6,290	11,196	9,122
1998	Wet	7,947	10,365	11,295	11,428	10,402	8,588	8,866	9,753	9,680	11,280	11,251	11,170
1999	Wet	11,067	10,944	11,479	11,680	9,913	9,308	7,073	4,356	6,383	9,342	11,198	11,142
2000	Above Normal	10,201	10,927	8,617	11,684	11,775	10,337	6,731	5,282	6,943	7,665	11,207	10,618
2001	Dry	10,487	10,267	11,287	11,704	11,729	10,133	2,905	2,211	2,683	8,794	3,567	5,207
2002	Dry	5,687	7,729	11,278	11,717	11,100	4,410	4,169	3,925	6,000	11,036	9,998	6,588
2003	Above Normal	5,610	10,913	11,237	11,442	1,332	8,828	6,045	6,245	6,837	8,135	11,183	10,991
	Average	8,546	8,863	9,987	10,563	9,078	7,950	5,278	5,098	6,250	8,927	8,765	9,055
	Wet	9,509	10,313	11,398	11,320	10,570							

San Joaquin River Restoration Program

Table 150: Simulated Exports Through Banks and Jones Pumping Plants (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	10,481	7,934	11,414	11,708	12,753	10,558	7,599	6,961	9,330	11,260	11,216	11,152
1923	Below Normal	10,903	10,933	11,636	11,748	7,525	6,731	7,798	5,506	6,592	11,240	11,202	11,144
1924	Critical	10,931	7,749	8,081	7,434	4,686	1,108	1,494	2,542	5,402	2,953	1,500	4,621
1925	Dry	5,399	3,834	10,317	9,047	9,996	1,100	7,102	5,762	3,085	5,872	7,435	8,255
1926	Dry	5,714	6,741	5,935	11,517	10,191	5,607	6,287	3,090	3,660	6,340	7,480	9,644
1927	Wet	6,027	10,901	11,269	8,079	7,313	9,255	7,550	5,795	7,749	9,978	11,200	11,143
1928	Above Normal	9,866	10,927	11,341	11,726	11,083	10,829	7,238	3,940	6,423	5,052	11,205	10,678
1929	Critical	10,175	9,881	8,695	9,699	8,222	4,471	2,385	1,362	1,100	4,861	1,500	4,901
1930	Dry	5,038	4,335	10,666	11,439	8,285	7,555	2,981	2,973	2,370	7,722	5,872	7,783
1931	Critical	5,471	5,159	4,465	9,713	5,504	3,082	1,100	1,553	1,519	6,334	1,500	4,631
1932	Dry	4,899	3,752	11,385	11,607	8,694	5,103	2,459	3,601	2,070	2,862	7,625	9,515
1933	Critical	5,521	5,473	5,884	8,096	6,127	5,694	2,353	2,839	1,100	2,199	1,500	4,813
1934	Critical	5,355	4,059	9,513	9,478	6,917	1,821	1,100	1,100	1,579	2,380	1,817	4,580
1935	Below Normal	4,793	7,270	6,972	11,721	6,319	8,470	6,819	4,992	6,670	10,428	7,174	9,861
1936	Below Normal	7,636	7,017	7,846	11,612	9,887	9,858	7,549	5,347	5,963	10,918	7,596	10,782
1937	Below Normal	8,541	6,971	7,880	10,166	9,732	7,921	7,062	6,139	4,568	6,310	7,174	9,203
1938	Wet	7,314	10,909	11,831	7,143	7,397	8,629	8,713	10,143	9,680	11,280	11,251	11,170
1939	Dry	11,067	10,944	11,342	10,414	7,720	6,910	1,383	4,411	5,844	10,575	2,914	5,256
1940	Above Normal	7,539	7,002	7,827	12,006	12,234	11,837	8,874	5,810	6,777	7,763	11,215	11,151
1941	Wet	10,489	9,643	11,642	12,460	12,746	11,613	9,707	8,875	7,685	11,267	11,222	11,155
1942	Wet	11,037	10,934	11,621	11,749	11,888	9,587	8,819	8,052	9,525	11,280	11,234	11,161
1943	Wet	11,049	10,938	11,480	11,730	11,890	10,061	8,199	5,547	5,905	7,559	10,609	10,416
1944	Dry	9,957	8,613	10,132	10,668	11,306	8,896	4,395	4,347	6,369	10,988	7,367	9,102
1945	Below Normal	7,555	10,913	11,306	9,392	10,106	5,127	6,305	5,531	7,480	11,245	11,205	11,146
1946	Below Normal	10,675	10,929	11,900	12,726	4,179	8,388	5,511	5,266	6,470	11,210	10,900	9,580
1947	Dry	9,332	9,341	11,481	8,665	10,209	8,549	3,229	3,576	5,810	11,146	7,081	4,966
1948	Below Normal	6,934	8,979	5,267	11,226	6,191	6,175	6,493	5,410	8,153	9,914	11,095	10,833
1949	Dry	9,917	8,767	9,660	8,991	7,251	11,435	3,901	1,749	2,775	10,102	9,304	9,119
1950	Below Normal	6,063	7,534	5,888	11,592	10,965	8,126	6,731	4,038	6,162	6,800	7,931	11,054
1951	Above Normal	9,704	10,911	11,445	7,389	8,136	9,233	7,207	5,706	6,997	8,696	11,207	11,147
1952	Wet	10,273	10,617	11,359	12,726	12,311	11,289	9,131	9,699	9,680	11,280	11,251	11,170
1953	Wet	11,067	10,944	11,349	11,545	7,219	8,567	6,198	6,815	8,437	10,313	8,421	11,147
1954	Above Normal	11,023	10,930	10,994	11,144	11,312	10,403	6,830	4,654	6,037	7,232	9,985	10,205
1955	Dry	9,219	10,927	11,266	11,749	8,106	5,290	3,502	3,989	2,637	8,478	4,426	6,663
1956	Wet	5,809	8,458	11,893	11,425	10,003	8,235	7,295	7,370	9,680	11,256	8,924	11,150
1957	Above Normal	11,028	8,804	10,996	8,452	11,752	11,331	1,100	5,605	6,541	6,750	11,193	10,223
1958	Wet	11,007	10,925	11,287	11,123	11,448	9,626	9,336	9,482	9,680	11,280	11,251	11,170
1959	Below Normal	11,067	10,944	10,956	10,722	11,558	2,601	4,081	4,333	6,730	9,156	6,589	7,598
1960	Dry	8,080	8,274	7,806	9,280	11,728	8,261	1,100	2,696	5,486	10,582	7,696	9,498
1961	Dry	5,070	9,423	10,552	9,051	9,359	7,215	1,597	3,261	6,000	7,792	10,635	7,286
1962	Below Normal	5,610	5,786	10,484	5,819	12,658	10,036	5,699	5,144	6,542	10,497	11,178	8,569
1963	Wet	10,992	10,920	11,220	11,560	11,481	7,905	7,491	6,547	6,901	9,546	11,186	11,136
1964	Dry	11,000	10,923	11,267	11,632	6,362	5,084	1,933	2,879	5,390	11,182	9,965	6,393
1965	Wet	7,170	10,913	11,421	12,576	11,747	7,447	8,265	4,895	6,202	7,316	11,210	10,625
1966	Below Normal	9,381	10,931	11,754	11,523	10,659	10,695	4,668	3,732	6,430	10,070	11,199	10,121
1967	Wet	10,671	10,927	11,402	11,848	11,417	11,422	9,556	9,469	9,680	11,280	11,251	11,170
1968	Below Normal	11,067	10,944	11,306	11,219	10,452	9,166	1,689	4,437	6,943	9,694	10,688	7,790
1969	Wet	8,865	9,371	11,285	12,725	11,857	9,406	8,832	10,151	9,680	11,280	11,251	11,170
1970	Wet	11,067	10,944	11,533	11,625	9,093	9,149	5,395	4,293	6,512	9,355	10,530	8,743
1971	Wet	9,006	10,927	11,311	11,750	9,018	11,527	7,437	6,602	8,422	10,403	11,201	11,144
1972	Below Normal	11,016	10,363	11,284	11,472	8,944	11,070	3,989	4,199	6,745	7,821	10,562	8,439
1973	Above Normal	7,202	10,924	11,267	10,886	11,597	9,861	6,645	4,426	6,401	10,420	11,198	10,183
1974	Wet	10,844	10,927	11,728	12,606	11,742	10,178	8,002	6,181	7,554	11,265	11,221	11,154
1975	Wet	11,036	10,934	11,392	10,902	11,844	11,346	7,506	6,140	9,680	11,235	11,198	11,142
1976	Critical	11,012	10,926	11,304	10,744	7,717	7,303	3,075	2,468	5,045	8,618	6,268	4,744
1977	Critical	4,735	6,496	3,856	5,402	2,688	1,514	1,100	1,272	2,085	1,723	3,363	4,242
1978	Above Normal	4,240	4,250	8,868	11,893	11,706	9,499	8,474	8,153	8,147	11,280	11,247	11,168
1979	Below Normal	11,063	10,310	9,378	12,268	11,743	10,608	6,126	7,070	6,914	9,991	8,484	10,171
1980	Above Normal	9,170	10,926	11,314	12,670	9,478	8,346	7,190	5,438	7,330	8,878	7,755	11,157
1981	Dry	9,461	8,387	10,634	11,714	10,907	11,153	4,652	4,329	6,480	10,869	7,721	8,816
1982	Wet	9,992	10,930	11,307	11,915	11,847	11,131	8,525	9,832	9,680	11,280	11,251	11,170
1983	Wet	11,067	10,944	11,905	11,752	11,770	8,676	8,857	10,141	9,680	11,280	11,251	11,170
1984	Wet	11,067	10,944	11,085	8,521	9,524	9,304	4,672	3,771	6,273	10,373	11,185	10,430
1985	Dry	11,000	10,922	11,279	11,455	8,221	5,980	4,229	4,493	6,126	11,229	11,193	9,852
1986	Wet	8,700	9,203	11,301	11,549	12,741	10,547	8,066	8,355	5,951	7,308	10,025	10,873
1987	Dry	10,133	9,356	7,983	9,116	8,307	8,109	1,100	3,978	5,910	10,748	3,164	4,701
1988	Critical	6,374	5,786	11,206	11,449	2,121	1,706	3,093	1,702	4,528	8,981	1,618	4,395
1989	Dry	4,262	5,401	6,679	6,272	2,366	10,639	4,891	2,686	5,914	11,173	10,493	7,723
1990	Critical	7,819	7,309	7,761	11,350	3,582	4,959	1,100	2,415	3,900	5,225	1,500	4,374
1991	Critical	4,580	4,003	3,489	2,452	3,021	11,410	1,821	2,568	1,800	5,524	2,078	4,038
1992	Critical	4,987	3,038	4,399	4,862	11,725	7,730	2,027	1,100	2,910	2,992	4,985	5,040
1993	Above Normal	3,904	4,234	7,871	12,460	12,138	11,255	6,832	5,346	9,155	11,214	11,182	11,129
1994	Critical	10,996	9,152	9,234	9,863	10,757	4,407	2,735	3,248	5,636	11,236	9,029	5,918
1995	Wet	7,429	6,202	10,834	12,135	11,958	11,350	8,673	10,136	9,680	11,280	11,251	11,170
1996	Wet	11,067	10,944	11,316	11,290	10,536	8,645	8,174	6,779	7,019	7,924	9,751	11,153
1997	Wet	8,301	10,933	11,901	11,726	11,862	9,078	6,041	4,127	5,639	6,875	11,197	9,172
1998	Wet	8,042	10,503	11,295	11,428	10,800	8,588	8,866	9,593	9,680	11,280	11,251	11,170
1999	Wet	11,067	10,944	11,479	11,680	10,159	9,308	7,389	4,369	6,398	9,318	11,200	11,143
2000	Above Normal	10,257	10,927	9,678	10,678	11,773	10,487	7,058	5,343	6,946	7,716	11,209	10,618
2001	Dry	10,466	9,694	11,298	11,704	11,776	10,370	3,481	2,211	2,652	8,823	4,838	5,133
2002	Dry	5,670	8,004	11,278	11,237	1,100	4,940	4,275	3,946	6,000	11,052	10,275	6,879
2003	Above Normal	5,861	10,917	11,239	11,445	1,338	8,828	6,855	6,458	6,833	8,163	11,186	11,061
	Average	8,618	8,986	10,054	10,577	9,302	8,253	5,549	5,125	6,257	8,956	8,752	9,054
	Wet	9,633	10,449	11,440	11,368	10,83							

Table 151: Simulated Old & Middle River Flow (cfs) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	-9,582	-6,928	-9,151	-9,262	-8,630	-7,494	-6,540	-6,572	-4,506	-9,580	-10,167	-10,324
1923	Below Normal	-9,813	-9,907	-8,668	-7,811	-4,548	-4,831	-6,605	-5,376	-6,024	-10,803	-10,214	-10,139
1924	Critical	-9,910	-6,964	-6,533	-5,916	-3,295	-315	-1,667	-2,985	-5,674	-3,166	-1,617	-4,547
1925	Dry	-4,936	-3,565	-8,290	-7,433	-7,745	-129	-6,300	-5,303	-3,222	-5,987	-7,006	-7,626
1926	Dry	-5,152	-5,660	-4,614	-9,626	-8,264	-4,772	-6,227	-3,414	-4,255	-5,864	-7,070	-9,121
1927	Wet	-5,516	-9,932	-9,571	-6,042	-4,517	-7,052	-6,622	-5,747	-7,495	-9,676	-10,488	-10,468
1928	Above Normal	-8,907	-9,848	-9,281	-9,457	-8,951	-7,416	-6,779	-4,141	-6,607	-5,339	-10,657	-10,086
1929	Critical	-9,251	-8,680	-7,203	-7,872	-6,449	-2,535	-2,357	-1,799	-1,319	-5,029	-1,625	-4,727
1930	Dry	-4,696	-3,759	-9,021	-9,590	-6,562	-6,236	-2,846	-3,189	-2,881	-7,753	-5,600	-7,365
1931	Critical	-5,077	-4,684	-3,436	-8,063	-4,154	-2,043	-1,614	-2,003	-2,014	-6,793	-1,743	-4,560
1932	Dry	-4,606	-3,203	-9,117	-9,500	-5,259	-3,286	-1,702	-3,686	-1,878	-3,745	-7,214	-9,039
1933	Critical	-5,024	-4,775	-4,676	-6,763	-4,620	-4,238	-2,382	-3,047	-1,497	-2,101	-1,760	-4,672
1934	Critical	-4,955	-3,550	-7,744	-8,709	-5,264	-944	-1,593	-1,660	-2,050	-2,952	-2,029	-4,495
1935	Below Normal	-4,480	-6,727	-4,940	-9,452	-4,799	-6,909	-5,864	-4,926	-6,522	-10,039	-6,880	-8,448
1936	Below Normal	-6,909	-6,408	-6,376	-9,506	-3,571	-5,859	-6,148	-5,163	-5,774	-10,172	-7,303	-10,057
1937	Below Normal	-7,666	-6,235	-6,262	-6,870	-1,384	-1,266	-6,269	-5,653	-4,271	-5,814	-6,561	-9,363
1938	Wet	-6,272	-9,886	-6,798	-3,572	6,588	8,931	-6,932	-8,473	-1,827	-7,793	-9,531	-9,970
1939	Dry	-9,777	-9,854	-9,266	-8,215	-5,604	-4,736	-1,434	-4,597	-6,244	-10,688	-2,613	-4,863
1940	Above Normal	-6,599	-6,286	-6,431	-9,132	-8,685	-7,582	-6,991	-5,676	-6,596	-7,732	-10,555	-9,764
1941	Wet	-8,529	-8,401	-8,746	-8,842	-3,858	-4,712	-6,656	-7,980	-5,736	-9,182	-10,034	-10,357
1942	Wet	-9,999	-9,735	-8,694	-5,664	-3,673	-5,960	-6,860	-7,322	-6,893	-8,837	-9,606	-9,986
1943	Wet	-9,993	-9,762	-9,046	-4,454	-4,925	-2,650	-6,702	-5,513	-4,608	-7,151	-9,570	-9,424
1944	Dry	-8,612	-8,203	-7,502	-8,589	-8,107	-6,594	-3,866	-4,437	-6,348	-10,774	-7,636	-9,297
1945	Below Normal	-7,007	-9,939	-9,366	-7,436	-4,015	-180	-5,175	-5,330	-7,154	-10,646	-10,186	-10,449
1946	Below Normal	-9,443	-9,915	-7,558	-8,855	-768	-4,989	-4,851	-5,134	-6,133	-10,998	-9,623	-8,882
1947	Dry	-8,241	-8,155	-9,111	-6,634	-7,956	-6,822	-2,204	-4,048	-6,104	-11,108	-6,682	-4,690
1948	Below Normal	-6,821	-8,055	-4,519	-9,701	-5,009	-4,649	-5,888	-5,288	-7,626	-9,204	-10,667	-10,568
1949	Dry	-8,804	-6,505	-8,048	-6,510	-395	-9,211	-3,713	-2,226	-2,985	-9,792	-8,858	-7,862
1950	Below Normal	-5,575	-6,855	-4,541	-9,466	-8,130	-6,311	-6,272	-4,200	-6,053	-7,840	-7,390	-10,461
1951	Above Normal	-8,835	-9,829	-3,143	56	-2,530	-5,780	-5,541	-5,566	-6,879	-8,574	-10,641	-10,477
1952	Wet	-9,402	-9,472	-9,063	-8,091	-9,195	-3,889	-7,278	-8,496	-3,876	-8,039	-9,534	-10,046
1953	Wet	-10,178	-9,907	-9,080	-8,420	-4,506	-6,756	-5,226	-6,567	-7,968	-10,021	-8,855	-10,472
1954	Above Normal	-10,138	-9,942	-9,160	-9,144	-9,458	-8,150	-6,419	-4,826	-6,104	-7,374	-9,563	-9,604
1955	Dry	-8,319	-9,979	-9,411	-9,257	-5,666	-3,840	-3,174	-4,020	-2,967	-9,458	-2,980	-6,642
1956	Wet	-5,363	-7,588	-6,831	446	-3,877	-4,585	-6,052	-6,626	-6,980	-9,208	-8,970	-10,164
1957	Above Normal	-10,026	-8,089	-9,002	-6,353	-9,523	-8,610	-1,214	-5,249	-6,755	-6,633	-10,592	-9,547
1958	Wet	-10,072	-10,038	-9,430	-8,906	-8,042	-2,736	-6,431	-8,237	-4,811	-8,835	-9,542	-9,998
1959	Below Normal	-10,131	-9,959	-8,724	-8,531	-8,695	-1,388	-3,719	-4,553	-7,087	-9,305	-6,194	-6,912
1960	Dry	-7,651	-7,392	-6,444	-7,613	-9,430	-6,716	-1,138	-3,030	-6,095	-10,603	-7,446	-8,993
1961	Dry	-4,740	-8,675	-8,977	-7,386	-7,395	-5,718	-1,850	-3,604	-6,613	-7,878	-10,188	-6,516
1962	Below Normal	-5,337	-5,274	-8,868	-4,703	-8,647	-7,381	-4,851	-5,249	-6,663	-10,377	-10,083	-8,041
1963	Wet	-10,189	-10,131	-9,542	-9,465	-9,337	-5,754	-6,768	-6,601	-6,688	-9,249	-10,536	-10,355
1964	Dry	-10,003	-9,950	-9,483	-9,489	-4,897	-3,844	-1,909	-3,239	-5,560	-11,077	-9,379	-5,798
1965	Wet	-6,512	-10,076	-9,061	-7,430	-7,592	-3,482	-6,802	-4,869	-5,710	-7,134	-9,741	-9,740
1966	Below Normal	-8,235	-9,651	-8,550	-8,417	-7,489	-7,610	-4,386	-4,001	-6,668	-9,934	-10,747	-9,490
1967	Wet	-9,792	-9,977	-9,192	-8,780	-9,403	-7,935	-6,780	-8,350	-3,389	-5,184	-9,410	-9,907
1968	Below Normal	-10,039	-9,989	-9,315	-8,929	-8,080	-7,290	-1,581	-4,566	-7,234	-9,724	-9,819	-7,312
1969	Wet	-8,023	-8,292	-9,364	-6,418	5,406	2,269	-6,974	-8,234	286	-7,824	-9,664	-10,048
1970	Wet	-9,719	-8,834	-8,974	-1,941	-4,335	-5,216	-5,436	-4,458	-6,488	-9,056	-9,934	-8,377
1971	Wet	-8,003	-9,819	-8,983	-9,415	-8,028	-9,171	-6,288	-6,322	-8,315	-10,178	-10,651	-10,511
1972	Below Normal	-10,070	-9,099	-9,333	-9,556	-7,042	-9,012	-3,759	-4,559	-7,086	-8,030	-10,039	-7,883
1973	Above Normal	-6,483	-9,825	-9,306	-8,087	-7,735	-6,922	-5,482	-4,485	-6,055	-10,174	-10,255	-10,284
1974	Wet	-9,821	-9,785	-8,536	-8,041	-8,625	-5,223	-6,889	-5,936	-5,757	-10,234	-10,189	-10,358
1975	Wet	-9,807	-9,769	-9,186	-8,542	-7,328	-5,580	-6,400	-6,067	-7,399	-10,101	-10,009	-10,427
1976	Critical	-9,764	-9,820	-9,417	-8,710	-5,899	-5,917	-3,044	-2,999	-5,164	-8,487	-5,742	-4,535
1977	Critical	-4,422	-5,985	-3,013	-4,239	-1,809	-1,106	-1,564	-1,530	-2,743	-2,450	-3,594	-4,267
1978	Above Normal	-4,107	-3,815	-7,466	-9,107	-6,930	-4,953	-7,118	-7,839	-4,368	-10,099	-10,169	-10,217
1979	Below Normal	-10,285	-9,002	-6,881	-9,122	-7,234	-4,837	-5,257	-6,560	-6,542	-9,885	-8,025	-9,580
1980	Above Normal	-8,239	-9,928	-9,359	-5,294	4,344	-302	-6,617	-4,917	-3,499	-6,903	-7,451	-10,277
1981	Dry	-8,319	-7,240	-8,505	-9,478	-8,757	-7,485	-4,234	-4,529	-6,646	-10,855	-7,267	-8,312
1982	Wet	-9,122	-10,015	-9,389	-8,916	-2,522	-1,708	-5,949	-8,638	-5,664	-8,238	-9,370	-8,962
1983	Wet	-8,806	-7,501	60	4,939	11,153	21,790	-6,502	-8,104	1,243	-1,772	-7,597	-8,980
1984	Wet	-9,512	-6,250	3,104	-606	-4,012	-5,330	-4,111	-3,865	-5,888	-9,931	-10,306	-9,371
1985	Dry	-9,612	-9,621	-9,500	-9,274	-6,037	-4,103	-3,972	-4,834	-6,470	-10,974	-10,386	-9,099
1986	Wet	-7,782	-8,001	-9,236	-9,482	-2,500	6,241	-6,961	-7,831	-3,176	-6,747	-9,007	-9,839
1987	Dry	-9,032	-8,073	-6,269	-7,261	-6,716	-6,320	-1,311	-4,376	-6,138	-10,595	-3,164	-4,607
1988	Critical	-5,871	-5,352	-9,545	-9,640	-1,130	-994	-3,227	-2,128	-4,826	-9,231	-1,779	-4,395
1989	Dry	-4,167	-4,702	-5,531	-4,921	-1,298	-9,141	-4,991	-3,244	-6,508	-11,267	-10,425	-7,227
1990	Critical	-7,306	-6,756	-6,508	-9,743	-2,443	-4,088	-1,536	-2,471	-4,874	-5,367	-1,787	-4,371
1991	Critical	-4,332	-3,555	-2,475	-2,062	-2,092	-9,614	-1,897	-2,843	-2,325	-6,118	-2,418	-4,165
1992	Critical	-4,638	-2,588	-3,497	-3,943	-9,323	-6,378	-2,243	-1,828	-3,504	-3,589	-4,977	-5,097
1993	Above Normal	-3,783	-3,772	-6,548	-8,477	-8,760	-8,480	-6,246	-5,153	-7,028	-9,892	-10,032	-10,434
1994	Critical	-10,041	-6,476	-8,158	-7,572	-8,851	-3,492	-2,752	-3,324	-6,325	-11,377	-10,848	-6,812
1995	Wet	-6,085	-3,749	-9,113	-8,551	-9,391	-68	-8,255	-8,444	-4,509	-3,745	-9,414	-10,358
1996	Wet	-10,117	-9,912	-9,274	-8,544	-2,805	-2,024	-7,112	-6,329	-5,446	-7,622	-9,008	-10,362
1997	Wet	-7,346	-9,569	315	26,351	1,375	-3,424	-4,967	-3,878	-5,714	-6,257	-10,435	-8,410
1998	Wet	-7,056	-9,310	-9,249	-7,769	5,509	-1,090	-7,402	-7,965	-1,456	-3,687	-9,191	-9,802
1999	Wet	-9,553	-9,692	-9,079	-8,025	-3,444	-5,495	-6,328	-4,217	-5,882	-9,056	-10,434	-10,388
2000	Above Normal	-9,312	-9,895	-7,080	-9,337	-5,518	-6,042	-6,206	-5,181	-6,622	-7,662	-10,538	-9,794
2001	Dry	-9,337	-9,289	-9,396	-9,389	-9,410	-7,681	-2,728	-2,724	-3,138	-8,736	-3,475	-4,880
2002	Dry	-5,349	-7,061	-9,046	-9,319	-137	-3,125	-4,245	-3,750	-6,378	-11,022	-9,465	-6,407
2003	Above Normal	-5,343	-10,120	-9,208	-9,707	-305	-7,400	-5,604	-6,238	-7,249	-8,273	-10,596	-10,398
	Average	-7,777	-7,948	-7,570	-7,055	-4,987	-4,248	-4,802	-4,980	-5,195	-8,178	-8,082	-8,425
	Wet	-8,560	-9,092	-7,768	-5,161	-3,534	-2,127	-6,488	-6,733	-5,006	-7,875	-9,655	-9,888
	Above Normal	-7,613	-8,190	-7,928	-7,775	-6,057	-6,594	-5,896	-5,487	-6,022	-8,186	-10,101	-10,100
	Below Normal	-7,987	-8,358	-7,421	-8,454	-5,672	-5,179	-5,045	-5,040	-6,488	-9,484	-8,83	

San Joaquin River Restoration Program

Table 152: Simulated Old & Middle River Flow (cfs) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	-9,631	-7,077	-9,151	-9,262	-8,564	-7,172	-6,782	-6,563	-4,488	-9,578	-10,164	-10,317
1923	Below Normal	-9,862	-9,851	-8,870	-7,841	-4,526	-4,822	-6,813	-5,386	-5,994	-10,796	-10,208	-10,130
1924	Critical	-9,826	-6,971	-6,541	-5,896	-3,332	-159	-1,667	-2,992	-5,675	-3,357	-1,617	-4,547
1925	Dry	-4,970	-3,365	-8,607	-7,435	-7,680	220	-6,409	-5,355	-3,204	-6,011	-6,994	-7,619
1926	Dry	-5,173	-6,045	-4,638	-9,622	-8,234	-4,306	-6,051	-3,433	-4,299	-6,628	-7,067	-9,161
1927	Wet	-5,567	-9,876	-9,571	-6,367	-4,479	-6,709	-6,859	-5,881	-7,488	-9,687	-10,487	-10,460
1928	Above Normal	-8,921	-9,784	-9,269	-9,455	-8,933	-7,140	-6,683	-4,118	-6,578	-5,301	-10,655	-9,984
1929	Critical	-9,285	-8,890	-7,108	-7,873	-6,510	-3,067	-2,365	-1,812	-1,290	-5,129	-1,623	-4,744
1930	Dry	-4,721	-3,873	-9,094	-9,590	-6,557	-5,974	-2,900	-3,215	-2,763	-7,752	-5,603	-7,349
1931	Critical	-5,094	-4,684	-3,433	-8,066	-4,152	-2,184	-1,614	-2,017	-2,013	-6,748	-1,743	-4,560
1932	Dry	-4,619	-3,336	-9,115	-9,500	-5,439	-3,246	-2,402	-3,733	-2,241	-3,132	-7,218	-9,033
1933	Critical	-5,062	-4,896	-4,659	-6,425	-4,656	-4,083	-2,549	-3,065	-1,475	-2,751	-1,634	-4,689
1934	Critical	-4,971	-3,641	-7,909	-7,823	-5,260	-976	-1,586	-1,657	-2,008	-2,946	-2,024	-4,512
1935	Below Normal	-4,496	-6,606	-5,594	-9,451	-4,731	-6,283	-6,031	-4,940	-6,532	-10,063	-6,829	-9,338
1936	Below Normal	-6,939	-6,298	-6,367	-9,505	-4,347	-5,515	-6,893	-5,241	-5,754	-10,686	-9,663	-10,052
1937	Below Normal	-7,734	-6,235	-6,258	-7,758	-2,278	-1,860	-6,243	-5,820	-4,279	-6,199	-6,563	-8,485
1938	Wet	-6,536	-9,827	-7,759	-3,692	5,594	8,711	-7,060	-8,504	-1,983	-7,791	-9,528	-9,964
1939	Dry	-9,758	-9,797	-9,266	-8,254	-5,598	-4,632	-1,443	-4,605	-6,222	-10,527	-2,813	-4,880
1940	Above Normal	-6,787	-6,224	-6,431	-9,132	-8,666	-7,244	-7,947	-5,684	-6,598	-7,732	-10,561	-10,404
1941	Wet	-9,618	-8,714	-8,748	-8,845	-4,585	-4,879	-8,408	-8,062	-5,034	-9,182	-10,033	-10,351
1942	Wet	-9,982	-9,679	-8,696	-6,606	-6,423	-5,768	-7,675	-7,329	-6,873	-8,856	-9,622	-9,989
1943	Wet	-9,994	-9,712	-9,048	-5,474	-6,260	339	-7,153	-5,437	-4,597	-7,123	-9,661	-9,657
1944	Dry	-8,910	-7,536	-8,118	-8,510	-8,625	-6,488	-3,906	-4,448	-6,324	-10,768	-6,943	-8,553
1945	Below Normal	-8,850	-9,883	-9,366	-7,435	-5,175	-488	-5,893	-5,347	-7,184	-10,645	-10,185	-10,444
1946	Below Normal	-9,576	-9,854	-7,443	-8,855	-1,038	-4,991	-5,193	-5,144	-6,106	-11,000	-10,284	-8,868
1947	Dry	-9,377	-8,327	-9,096	-6,623	-7,891	-6,683	-3,195	-4,022	-6,088	-11,072	-6,698	-4,706
1948	Below Normal	-6,237	-8,187	-4,123	-9,477	-4,867	-4,581	-5,981	-5,319	-7,945	-9,804	-10,567	-10,294
1949	Dry	-9,163	-7,980	-8,063	-7,329	-5,606	-8,987	-3,810	-2,186	-2,966	-10,035	-8,825	-8,698
1950	Below Normal	-5,629	-6,813	-4,616	-9,468	-8,913	-6,371	-6,436	-4,283	-6,031	-6,930	-7,619	-10,455
1951	Above Normal	-8,933	-9,771	-4,607	-436	-2,798	-5,442	-6,539	-5,552	-6,913	-8,654	-10,641	-10,472
1952	Wet	-9,459	-9,651	-9,051	-7,981	-9,048	-4,303	-7,716	-8,486	-4,085	-8,037	-9,531	-10,039
1953	Wet	-10,159	-9,851	-9,080	-8,420	-4,577	-6,675	-5,617	-6,579	-7,962	-10,094	-7,948	-10,467
1954	Above Normal	-10,124	-9,884	-9,167	-9,177	-9,461	-8,290	-6,384	-4,815	-6,093	-7,350	-9,469	-9,617
1955	Dry	-8,444	-9,923	-9,411	-9,257	-6,368	-3,756	-3,176	-4,127	-2,916	-8,488	-4,289	-6,273
1956	Wet	-5,415	-7,728	-7,542	233	-3,936	-4,341	-6,608	-6,851	-6,342	-9,207	-7,892	-10,039
1957	Above Normal	-10,002	-7,905	-9,132	-6,663	-9,518	-9,232	-931	-5,309	-6,530	-8,800	-10,591	-9,567
1958	Wet	-10,054	-9,981	-9,430	-8,908	-7,996	-3,341	-7,277	-8,268	-4,879	-8,833	-9,539	-9,992
1959	Below Normal	-10,112	-9,903	-8,920	-8,531	-8,651	-910	-3,897	-4,563	-7,023	-9,364	-6,365	-6,918
1960	Dry	-7,375	-7,459	-6,444	-7,609	-9,407	-6,693	-1,134	-3,040	-6,075	-10,674	-7,435	-8,977
1961	Dry	-4,740	-8,674	-8,978	-7,386	-7,663	-5,660	-1,854	-3,617	-6,613	-8,112	-10,173	-7,064
1962	Below Normal	-5,358	-5,237	-8,926	-4,699	-8,604	-7,275	-5,435	-5,213	-6,744	-10,457	-10,614	-8,166
1963	Wet	-10,176	-10,084	-9,556	-9,466	-8,884	-5,981	-6,664	-6,287	-6,667	-9,227	-10,526	-10,345
1964	Dry	-9,974	-9,882	-9,467	-9,486	-4,862	-3,776	-2,008	-3,261	-5,540	-11,080	-9,404	-5,987
1965	Wet	-6,570	-10,020	-9,062	-7,578	-7,968	-4,298	-7,326	-4,851	-5,740	-7,090	-9,800	-9,693
1966	Below Normal	-8,580	-9,598	-8,550	-8,417	-7,471	-8,330	-4,452	-4,001	-6,676	-9,930	-10,746	-9,515
1967	Wet	-9,835	-9,920	-9,190	-8,779	-9,358	-8,311	-7,582	-8,346	-4,051	-5,062	-9,408	-9,901
1968	Below Normal	-10,020	-9,933	-9,315	-8,929	-8,032	-6,952	-1,577	-4,576	-7,197	-9,690	-9,895	-7,320
1969	Wet	-8,061	-8,412	-9,364	-7,095	4,219	1,795	-6,968	-8,192	-533	-7,826	-9,661	-10,042
1970	Wet	-9,700	-9,778	-8,974	-2,188	-4,264	-4,899	-4,946	-4,468	-6,452	-9,175	-10,028	-8,176
1971	Wet	-8,048	-9,762	-8,983	-9,414	-7,068	-8,939	-6,763	-6,326	-8,315	-10,192	-10,659	-10,510
1972	Below Normal	-10,062	-9,392	-9,334	-9,557	-7,111	-9,473	-3,849	-4,580	-7,070	-7,910	-10,089	-7,876
1973	Above Normal	-6,535	-9,768	-9,305	-8,090	-7,690	-6,538	-6,100	-4,529	-6,011	-10,179	-10,249	-9,375
1974	Wet	-9,641	-9,708	-8,554	-8,555	-8,580	-5,815	-7,047	-6,026	-5,747	-10,232	-10,188	-10,333
1975	Wet	-9,777	-9,704	-9,170	-8,701	-7,322	-6,306	-6,649	-6,074	-7,193	-10,096	-10,005	-10,419
1976	Critical	-9,762	-9,811	-9,403	-8,711	-5,900	-5,839	-3,056	-2,999	-5,134	-8,505	-5,803	-4,546
1977	Critical	-4,410	-5,982	-2,937	-4,245	-1,795	-1,105	-1,564	-1,530	-2,746	-2,450	-3,580	-4,267
1978	Above Normal	-4,133	-3,909	-7,496	-9,107	-7,568	-5,099	-7,227	-7,453	-4,270	-10,097	-10,164	-10,209
1979	Below Normal	-10,262	-9,160	-7,567	-9,121	-6,796	-5,391	-5,586	-6,665	-6,508	-9,843	-7,688	-9,573
1980	Above Normal	-8,229	-9,861	-9,340	-6,163	3,258	-588	-6,530	-5,139	-3,126	-6,541	-6,836	-10,270
1981	Dry	-8,367	-7,388	-8,772	-9,478	-8,736	-8,621	-4,293	-4,531	-6,637	-10,698	-7,292	-8,306
1982	Wet	-9,171	-9,960	-9,789	-8,822	-3,297	-2,597	-5,962	-8,657	-5,401	-8,235	-9,367	-8,956
1983	Wet	-8,787	-7,750	-353	4,704	8,063	22,145	-6,514	-8,143	1,051	-1,774	-7,594	-8,974
1984	Wet	-9,490	-6,341	2,489	-881	-3,988	-5,006	-4,184	-3,875	-5,878	-9,994	-10,303	-9,474
1985	Dry	-9,530	-9,559	-9,491	-9,267	-6,033	-3,986	-4,031	-4,835	-6,454	-10,976	-10,387	-9,094
1986	Wet	-7,831	-8,145	-9,231	-9,483	-3,365	5,605	-6,950	-7,831	-2,921	-6,741	-9,019	-9,840
1987	Dry	-9,002	-8,167	-6,320	-7,321	-6,488	-5,998	-1,307	-4,394	-6,095	-10,619	-3,112	-4,623
1988	Critical	-5,942	-5,215	-9,539	-9,640	-1,127	-974	-3,247	-2,140	-4,857	-9,315	-1,877	-4,411
1989	Dry	-4,167	-4,915	-5,475	-5,086	-1,377	-8,924	-5,045	-3,227	-6,425	-11,286	-10,085	-7,221
1990	Critical	-7,334	-6,706	-6,508	-9,743	-2,593	-4,033	-1,525	-2,503	-4,425	-5,747	-1,784	-4,388
1991	Critical	-4,366	-3,611	-2,677	-1,746	-2,187	-9,382	-2,059	-2,967	-2,320	-6,017	-2,317	-4,182
1992	Critical	-4,714	-2,746	-3,571	-3,929	-9,301	-6,346	-2,276	-1,808	-3,560	-3,638	-5,192	-5,127
1993	Above Normal	-3,809	-3,925	-6,573	-8,478	-8,738	-8,193	-6,455	-5,352	-6,219	-9,877	-10,332	-10,419
1994	Critical	-10,104	-8,264	-7,760	-8,278	-8,858	-3,332	-2,782	-3,360	-6,052	-11,370	-8,923	-5,896
1995	Wet	-7,059	-5,680	-9,367	-8,552	-9,565	518	-7,447	-8,595	-4,370	-3,738	-9,408	-10,349
1996	Wet	-10,094	-9,853	-9,271	-8,542	-2,902	-2,321	-7,323	-6,222	-5,431	-7,698	-8,931	-10,356
1997	Wet	-7,405	-9,530	-1,161	26,048	1,018	-4,047	-5,659	-4,161	-4,913	-6,805	-10,416	-8,340
1998	Wet	-7,121	-9,372	-9,226	-7,781	3,885	-919	-7,427	-7,919	-2,397	-3,683	-9,189	-9,796
1999	Wet	-9,535	-9,635	-9,079	-8,025	-3,603	-5,157	-6,577	-4,227	-5,896	-9,030	-10,433	-10,382
2000	Above Normal	-9,346	-9,831	-8,033	-8,421	-5,184	-5,775	-6,465	-5,209	-6,562	-7,708	-10,537	-9,764
2001	Dry	-9,292	-8,685	-9,392	-9,389	-9,388	-7,581	-3,227	-2,722	-3,088	-8,758	-4,667	-4,804
2002	Dry	-5,314	-7,261	-9,042	-8,882	-118	-3,362	-4,305	-3,767	-6,353	-11,031	-9,721	-6,673
2003	Above Normal	-5,560	-10,067	-9,209	-9,708	-293	-7,190	-6,273	-6,389	-7,220	-8,296	-10,596	-10,457
	Average	-7,824	-8,015	-7,682	-7,131	-5,282	-4,300	-5,021	-5,002	-5,166	-8,201	-8,067	-8,415
	Wet	-8,657	-9,180	-7,937	-5,353	-4,027	-2,365	-6,783	-6,754	-5,004	-7,900	-9,587	-9,879
	Above Normal	-7,668	-8,167	-8,143	-7,841	-6,179	-6,492	-6,193	-5,509	-5,884	-8,176	-10,066	-10,071
	Below Normal	-7,980	-8,354	-7,503	-8,503	-5,896	-5,232	-5,306	-5,077	-6,503	-9,523	-8,901	-9,

Table 153: Simulated Previous Month X2 Position (km ) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	75	83	85	80	80	69	67	67	61	61	73	83
1923	Below Normal	86	85	85	72	68	72	74	70	71	76	78	84
1924	Critical	85	85	86	86	83	78	77	80	85	83	86	86
1925	Dry	89	90	87	84	83	64	65	68	72	76	82	86
1926	Dry	89	87	86	86	80	68	74	70	74	81	83	85
1927	Wet	88	88	78	78	69	55	59	59	65	73	74	83
1928	Above Normal	86	86	81	81	75	72	58	64	69	77	77	84
1929	Critical	86	87	85	84	84	79	78	80	81	82	86	86
1930	Dry	89	89	88	82	76	74	68	73	76	81	83	86
1931	Critical	89	87	86	86	84	81	82	81	85	83	86	86
1932	Dry	89	89	87	78	75	73	74	75	75	76	82	86
1933	Critical	89	87	86	86	81	81	78	77	81	82	86	86
1934	Critical	89	90	88	83	78	75	75	76	81	81	85	87
1935	Below Normal	89	89	87	85	73	74	70	62	64	72	77	84
1936	Below Normal	88	88	86	85	70	59	63	66	69	76	78	84
1937	Below Normal	87	87	86	85	81	66	61	65	69	74	79	85
1938	Wet	87	87	76	63	64	52	47	52	54	58	72	82
1939	Dry	79	79	83	84	83	80	76	77	78	81	80	86
1940	Above Normal	89	88	86	86	72	62	54	55	65	75	74	83
1941	Wet	86	87	86	70	57	51	52	53	58	68	75	83
1942	Wet	81	84	85	66	58	50	62	60	62	66	75	83
1943	Wet	80	84	80	71	59	58	54	61	67	76	77	84
1944	Dry	87	87	86	85	83	73	72	75	77	79	82	85
1945	Below Normal	88	87	84	80	82	66	66	72	74	76	79	84
1946	Below Normal	87	86	84	64	62	65	70	72	73	77	78	84
1947	Dry	88	87	86	81	82	77	74	75	77	80	81	86
1948	Below Normal	89	88	86	85	82	74	75	70	69	74	79	82
1949	Dry	85	87	86	84	83	73	66	73	74	78	83	84
1950	Below Normal	88	88	86	85	78	69	71	71	73	76	80	85
1951	Above Normal	86	87	68	56	55	55	62	69	72	76	75	83
1952	Wet	86	86	85	69	59	56	56	55	55	59	70	80
1953	Wet	75	81	84	69	57	64	70	72	69	71	76	84
1954	Above Normal	82	85	83	84	72	63	61	62	66	76	75	83
1955	Dry	87	87	85	76	75	75	78	77	78	80	82	85
1956	Wet	89	88	86	63	51	52	59	67	63	68	76	83
1957	Above Normal	80	82	85	85	82	71	64	68	71	76	77	84
1958	Wet	87	80	81	75	67	53	50	50	56	61	73	81
1959	Below Normal	76	80	83	85	72	64	67	74	78	78	78	84
1960	Dry	88	87	86	84	84	73	73	74	76	81	80	86
1961	Dry	88	87	86	82	82	72	73	76	78	81	82	83
1962	Below Normal	88	88	86	83	83	66	69	73	75	78	77	84
1963	Wet	88	73	79	72	76	62	65	56	63	72	73	83
1964	Dry	85	85	75	81	75	75	78	77	77	80	81	84
1965	Wet	88	88	84	64	54	61	67	62	66	75	76	84
1966	Below Normal	86	87	77	78	70	69	69	74	75	78	77	84
1967	Wet	87	87	84	71	64	61	59	58	58	59	68	80
1968	Below Normal	75	79	83	83	72	62	64	70	75	78	78	84
1969	Wet	88	88	86	76	58	51	54	56	56	60	73	83
1970	Wet	78	80	83	66	50	52	59	68	73	76	75	83
1971	Wet	88	88	80	65	62	65	64	67	66	72	74	83
1972	Below Normal	81	84	85	81	81	75	69	74	77	78	79	83
1973	Above Normal	88	88	79	73	60	55	57	67	71	74	76	83
1974	Wet	86	85	67	59	52	59	53	55	64	70	75	83
1975	Wet	78	83	84	81	79	64	56	64	65	68	76	83
1976	Critical	79	80	81	82	83	80	77	79	85	85	85	88
1977	Critical	90	87	88	85	85	82	82	81	85	86	86	87
1978	Above Normal	89	89	89	82	65	60	57	60	66	70	76	84
1979	Below Normal	86	86	86	84	75	67	65	69	71	74	79	85
1980	Above Normal	88	87	85	78	59	51	55	66	70	72	77	84
1981	Dry	86	87	86	84	74	71	69	73	78	80	81	86
1982	Wet	89	86	73	59	56	52	52	49	57	65	75	83
1983	Wet	74	72	64	56	52	47	42	49	52	54	60	67
1984	Wet	67	73	60	50	54	59	62	68	73	76	76	83
1985	Dry	87	85	73	73	79	78	76	76	76	80	81	84
1986	Wet	87	87	86	81	76	53	48	62	69	74	77	84
1987	Dry	86	87	86	85	82	77	71	74	77	80	81	86
1988	Critical	89	88	86	82	73	75	78	78	81	81	85	86
1989	Dry	89	89	86	88	81	80	67	69	74	79	80	84
1990	Critical	88	88	86	83	79	77	79	77	83	86	85	86
1991	Critical	89	89	88	87	86	83	72	74	83	86	85	86
1992	Critical	89	90	86	88	83	72	73	75	80	81	85	88
1993	Above Normal	90	88	88	84	65	60	64	64	65	67	75	83
1994	Critical	86	86	86	84	83	76	76	77	79	81	85	82
1995	Wet	88	90	86	84	61	61	48	53	53	58	64	74
1996	Wet	74	80	84	74	65	53	54	59	59	69	76	83
1997	Wet	81	85	80	60	46	51	62	69	73	77	77	84
1998	Wet	88	88	85	79	63	48	51	55	57	55	62	70
1999	Wet	69	75	71	67	64	55	56	63	67	73	76	83
2000	Above Normal	83	86	85	85	73	57	56	66	70	76	76	83
2001	Dry	86	85	86	82	79	73	71	74	78	81	82	86
2002	Dry	89	88	86	73	64	65	69	72	75	79	81	83
2003	Above Normal	88	88	81	70	62	65	69	68	64	72	75	83
	Average	85	86	83	78	71	66	65	68	71	75	78	84
	Wet	83	83	80	69	60	56	56	59	62	67	73	81
	Above Normal	85	86	83	79	68	62	60	65	68	73	76	83
	Below Normal	85	86	85	81	75	68	68	70	72	76	78	84
	Dry	87	87	85	82	79	73	72	74	76	80	81	85
	Critical	87	87	86	85	82	78	77	78	82	83	85	86

Source: CALSIM II Modeling (Node X2\_PRV)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 154: Simulated Previous Month X2 Position (km ) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	75	83	85	80	80	69	67	67	61	61	73	83
1923	Below Normal	86	85	85	72	68	72	74	69	71	76	78	84
1924	Critical	85	85	86	86	83	78	77	80	85	83	86	86
1925	Dry	89	90	87	84	83	64	65	67	72	76	82	86
1926	Dry	89	87	86	86	80	67	74	70	74	81	83	85
1927	Wet	88	88	78	78	69	55	59	59	65	73	74	83
1928	Above Normal	86	86	81	81	75	72	58	64	69	77	77	84
1929	Critical	86	87	85	84	84	79	78	80	81	82	86	86
1930	Dry	89	89	88	82	76	74	68	73	76	81	83	86
1931	Critical	89	87	86	86	84	81	82	81	85	83	86	86
1932	Dry	89	89	87	78	75	73	74	75	75	76	82	86
1933	Critical	89	87	86	86	80	80	78	77	81	82	86	86
1934	Critical	89	90	87	84	77	75	75	76	81	81	85	87
1935	Below Normal	89	89	86	86	73	75	70	62	64	72	77	84
1936	Below Normal	88	87	86	85	70	59	63	66	69	76	77	84
1937	Below Normal	87	87	86	86	82	67	61	65	69	74	79	85
1938	Wet	89	88	76	63	64	52	47	52	54	58	72	82
1939	Dry	79	79	83	84	83	79	76	76	78	81	81	86
1940	Above Normal	89	88	86	86	72	62	54	55	65	75	74	83
1941	Wet	86	86	86	70	58	52	52	54	58	68	75	83
1942	Wet	81	84	85	66	58	50	62	60	62	66	75	83
1943	Wet	80	84	80	71	59	58	54	61	67	76	77	84
1944	Dry	87	86	86	84	83	73	72	74	77	79	82	85
1945	Below Normal	89	88	84	80	82	66	66	72	74	76	79	84
1946	Below Normal	87	86	83	64	62	65	70	72	73	77	78	84
1947	Dry	88	87	86	81	82	77	73	75	77	80	81	86
1948	Below Normal	89	88	86	86	82	74	75	70	69	73	79	82
1949	Dry	86	87	86	83	84	80	68	73	74	78	83	84
1950	Below Normal	88	88	86	85	78	69	71	71	72	76	80	85
1951	Above Normal	86	87	68	56	55	55	62	69	72	76	75	83
1952	Wet	86	86	85	69	59	56	56	55	55	59	71	80
1953	Wet	75	81	83	69	57	64	70	71	69	71	76	84
1954	Above Normal	81	84	83	84	72	63	61	62	66	76	75	83
1955	Dry	87	87	84	76	75	75	77	77	78	80	83	86
1956	Wet	89	88	86	63	51	52	59	67	63	68	75	83
1957	Above Normal	79	81	84	85	82	71	65	68	71	76	76	84
1958	Wet	87	80	81	75	67	53	50	50	56	61	73	81
1959	Below Normal	76	80	83	84	72	64	67	74	78	78	78	84
1960	Dry	88	87	86	84	84	73	73	74	76	81	80	86
1961	Dry	88	87	86	82	82	72	73	75	78	81	82	83
1962	Below Normal	88	88	86	83	83	66	69	73	74	78	77	84
1963	Wet	88	73	79	72	76	62	65	56	63	71	73	83
1964	Dry	85	85	74	81	75	75	78	77	77	80	81	84
1965	Wet	88	88	84	64	54	61	67	62	66	75	76	84
1966	Below Normal	86	87	77	78	70	69	69	73	75	78	77	84
1967	Wet	87	87	84	71	64	61	59	58	58	60	68	80
1968	Below Normal	75	79	82	83	72	62	64	70	75	78	78	84
1969	Wet	88	88	86	76	58	51	54	56	56	61	73	83
1970	Wet	78	80	82	66	50	52	59	68	73	76	75	83
1971	Wet	88	88	79	65	62	65	64	67	66	72	74	83
1972	Below Normal	81	84	85	81	81	75	69	74	77	78	79	83
1973	Above Normal	88	88	79	73	60	55	57	67	70	74	76	83
1974	Wet	87	86	67	59	52	59	53	55	64	70	75	83
1975	Wet	78	82	84	81	79	64	56	64	65	68	76	83
1976	Critical	79	80	81	82	83	80	76	79	85	85	84	88
1977	Critical	90	87	88	85	86	82	82	81	85	86	86	87
1978	Above Normal	89	89	89	83	65	61	57	60	66	70	76	84
1979	Below Normal	86	86	86	84	75	67	65	69	71	74	79	85
1980	Above Normal	88	87	84	78	59	51	55	66	70	71	77	84
1981	Dry	86	87	86	84	74	71	69	73	78	80	81	86
1982	Wet	89	86	73	59	56	52	52	49	57	65	74	83
1983	Wet	74	71	64	57	52	47	42	49	52	54	60	67
1984	Wet	67	73	60	50	54	59	62	68	73	76	76	83
1985	Dry	87	85	73	73	79	78	76	76	76	80	81	84
1986	Wet	87	87	86	81	76	53	48	62	69	74	77	84
1987	Dry	86	87	86	85	82	76	70	74	77	80	81	86
1988	Critical	89	88	86	82	73	75	78	78	81	81	85	86
1989	Dry	89	89	86	87	82	80	67	69	74	79	80	84
1990	Critical	88	88	86	83	79	77	78	77	83	86	85	86
1991	Critical	89	89	88	88	85	83	72	74	82	85	86	85
1992	Critical	89	90	86	88	83	72	72	75	80	81	85	88
1993	Above Normal	90	88	88	84	65	60	63	63	65	67	75	83
1994	Critical	86	86	86	83	84	76	76	77	79	82	84	84
1995	Wet	88	89	85	84	61	60	48	53	53	58	64	74
1996	Wet	74	80	84	74	65	53	54	59	59	69	76	83
1997	Wet	81	85	80	60	46	51	62	69	73	77	77	84
1998	Wet	88	88	85	79	63	48	51	55	57	55	62	70
1999	Wet	69	75	71	67	64	55	56	63	67	73	76	83
2000	Above Normal	83	86	84	85	73	57	56	66	70	76	76	83
2001	Dry	86	86	86	82	79	73	71	74	78	81	82	86
2002	Dry	89	88	86	72	64	65	69	72	75	79	81	83
2003	Above Normal	88	87	81	70	62	65	69	68	64	72	75	83
	Average	85	85	83	78	71	66	65	68	71	75	78	84
	Wet	83	83	80	69	60	56	56	59	62	67	73	81
	Above Normal	85	86	83	79	68	62	60	64	67	73	75	83
	Below Normal	85	86	85	81	75	68	68	70	72	76	78	84
	Dry	87	87	85	82	79	74	72	74	76	80	82	85
	Critical	87	87	86	85	82	78	77	78	82	83	85	86

Source: CALSIM II Modeling (Node X2\_Prv)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Sacramento Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 155: Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								491	552	623	550	375
1922	Normal-Wet	291	102	105	367	355	373	391	491	552	623	140	549
1923	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1924	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1925	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1926	Normal-Dry	620	553	468	440	349	485	610	599	572	630	678	615
1927	Normal-Wet	550	460	470	367	334	364	391	398	500	532	540	550
1928	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1929	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1930	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1931	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1932	Normal-Wet	620	553	480	440	349	485	610	599	572	630	678	615
1933	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1934	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1935	Normal-Wet	544	441	450	432	365	379	475	537	540	630	556	113
1936	Normal-Wet	515	103	116	438	365	379	475	537	540	630	111	111
1937	Normal-Wet	109	102	102	233	365	379	475	537	540	116	110	109
1938	Wet	108	101	102	102	182	364	391	398	500	532	540	550
1939	Dry	620	541	480	440	349	485	610	599	572	630	678	441
1940	Normal-Wet	531	463	333	450	355	373	391	491	552	337	133	113
1941	Wet	428	103	105	103	334	364	391	398	500	298	113	205
1942	Normal-Wet	550	418	383	184	334	364	391	398	500	532	106	272
1943	Normal-Wet	106	102	104	364	334	364	391	398	500	532	540	550
1944	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	119
1945	Normal-Wet	544	452	468	438	365	379	475	537	540	497	227	551
1946	Normal-Wet	544	469	375	438	365	379	475	537	540	630	556	551
1947	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1948	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1949	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1950	Normal-Dry	544	469	468	438	365	379	475	537	446	110	107	334
1951	Normal-Wet	542	463	471	450	355	373	391	491	552	623	550	141
1952	Wet	110	103	102	102	290	364	391	398	500	532	140	550
1953	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1954	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1955	Normal-Dry	620	553	480	440	349	485	610	599	572	113	110	113
1956	Wet	108	272	170	298	334	364	391	398	500	532	540	550
1957	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	378
1958	Wet	110	103	104	103	334	364	391	398	500	532	540	543
1959	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1960	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1961	Critical High	620	553	480	440	349	485	610	599	572	630	678	615
1962	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	138
1963	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
1964	Dry	620	553	480	440	349	485	610	599	572	630	116	145
1965	Normal-Wet	550	460	470	407	334	364	391	398	500	474	459	550
1966	Normal-Dry	544	469	468	438	365	379	475	537	540	630	535	376
1967	Wet	110	102	102	102	102	364	391	398	165	532	540	550
1968	Dry	544	469	468	438	365	379	475	537	540	630	106	106
1969	Wet	103	101	102	101	102	364	391	398	500	532	107	136
1970	Normal-Dry	536	460	470	407	334	364	391	398	500	532	540	550
1971	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1972	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1973	Normal-Wet	542	463	191	318	355	373	391	491	552	623	112	550
1974	Normal-Wet	439	374	169	222	334	364	391	398	500	532	540	550
1975	Normal-Wet	531	412	463	386	334	364	391	398	500	532	540	550
1976	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1977	Critical Low	814	889	882	766	785	693	699	690	742	924	732	115
1978	Wet	105	101	102	104	224	373	391	491	552	623	230	550
1979	Normal-Wet	395	444	299	436	365	379	475	537	540	630	105	109
1980	Wet	103	102	104	127	245	373	391	491	552	623	550	550
1981	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	121
1982	Wet	110	101	102	103	306	364	391	226	107	103	102	105
1983	Wet	102	101	101	101	101	250	259	104	106	105	103	510
1984	Normal-Wet	544	460	470	407	334	364	391	398	500	532	540	550
1985	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	118
1986	Wet	103	101	102	103	332	364	391	398	500	508	515	550
1987	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1988	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1989	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1990	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1991	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1992	Dry	814	889	882	766	785	693	699	690	742	924	732	403
1993	Wet	528	103	220	231	355	373	391	491	552	623	550	550
1994	Dry	814	889	882	766	785	693	699	690	742	924	602	122
1995	Wet	107	101	102	103	102	360	391	398	500	414	540	459
1996	Normal-Wet	109	413	103	393	334	364	391	398	500	111	103	105
1997	Wet	112	415	105	407	334	364	391	398	500	532	528	117
1998	Wet	106	101	102	101	101	363	390	398	488	291	511	516
1999	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
2000	Normal-Wet	498	463	400	450	355	373	391	491	552	623	550	550
2001	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2002	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2003	Normal-Wet	542	463	471	450	355	373	391					
	Average	501	460	426	414	392	441	497	517	551	593	497	462
	Wet	153	132	114	143	236	358	383	386	439	457	384	437
	Normal-Wet	471	398	351	390	350	376	427	472	527	529	391	397
	Normal-Dry	601	541	508	464	388	451	535	555	564	598	581	491
	Dry	711	713	680	603	568	580	643	639	654	777	600	509
	Critical High	766	805	782	685	676	641	677	667	700	851	719	724
	Critical Low	814	889	882	766	785	693	699	690	742	924	732	115

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 156: Simulated Electrical Conductivity at Mendota Pool (umhos/cm) - Proposed Action

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								491	552	623	550	550
1922	Normal-Wet	238	180	331	341	355	373	391	491	552	623	170	550
1923	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1924	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1925	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1926	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1927	Normal-Wet	550	460	470	400	334	364	391	398	500	532	540	550
1928	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1929	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1930	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1931	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1932	Normal-Wet	620	553	480	440	349	485	610	599	572	630	678	615
1933	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1934	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1935	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	280
1936	Normal-Wet	544	294	327	438	365	379	475	537	540	630	111	130
1937	Normal-Wet	323	103	103	352	365	379	475	537	540	116	111	114
1938	Wet	145	102	102	103	185	364	391	398	500	532	540	550
1939	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1940	Normal-Wet	542	463	471	450	355	373	391	491	552	339	134	120
1941	Wet	550	460	470	407	334	364	391	398	500	298	134	299
1942	Normal-Wet	550	460	383	245	334	364	391	398	500	532	114	550
1943	Normal-Wet	109	236	192	364	334	364	391	398	500	532	540	550
1944	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	131
1945	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1946	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1947	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1948	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1949	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1950	Normal-Dry	544	469	468	438	365	379	475	537	540	136	113	551
1951	Normal-Wet	542	463	471	450	355	373	391	491	552	623	550	169
1952	Wet	333	277	103	104	290	364	391	398	500	532	540	550
1953	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1954	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1955	Normal-Dry	620	553	480	440	349	485	610	599	572	119	111	115
1956	Wet	108	291	470	407	334	364	391	398	500	532	540	550
1957	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1958	Wet	332	444	301	172	334	364	391	398	500	532	540	550
1959	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1960	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1961	Critical High	620	553	480	440	349	485	610	599	572	630	678	615
1962	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1963	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
1964	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1965	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
1966	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1967	Wet	479	222	103	103	102	364	391	398	165	532	540	550
1968	Dry	544	469	468	438	365	379	475	537	540	630	108	109
1969	Wet	104	101	102	102	102	364	391	398	500	532	108	136
1970	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1971	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1972	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1973	Normal-Wet	542	463	243	450	355	373	391	491	552	623	550	550
1974	Normal-Wet	550	359	400	303	334	364	391	398	500	532	540	550
1975	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
1976	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1977	Critical Low	814	889	882	766	785	693	699	690	742	924	732	118
1978	Wet	108	101	103	304	228	373	391	491	552	623	550	550
1979	Normal-Wet	544	463	437	436	365	379	475	537	540	630	108	115
1980	Wet	103	104	172	414	247	373	391	491	552	623	550	550
1981	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	361
1982	Wet	467	102	103	245	304	364	391	398	111	104	103	106
1983	Wet	103	101	102	102	102	250	259	104	107	107	104	538
1984	Normal-Wet	544	460	470	407	334	364	391	398	500	532	540	550
1985	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	121
1986	Wet	104	101	104	164	332	364	391	398	500	508	515	550
1987	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1988	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1989	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1990	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1991	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1992	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1993	Wet	542	463	471	450	355	373	391	491	552	623	550	550
1994	Dry	814	889	882	766	785	693	699	690	742	924	732	345
1995	Wet	126	102	102	180	104	360	391	398	500	414	540	550
1996	Normal-Wet	290	460	235	406	334	364	391	398	500	132	104	107
1997	Wet	301	460	470	407	334	364	391	398	500	532	528	126
1998	Wet	110	101	102	102	102	363	390	398	488	291	540	550
1999	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
2000	Normal-Wet	542	463	471	450	355	373	391	491	552	623	550	550
2001	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2002	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2003	Normal-Wet	542	463	471	450	355	373	391					
Average		529	484	463	437	392	441	497	519	552	596	527	502
Wet		251	221	211	235	237	358	383	397	439	457	433	453
Normal-Wet		500	421	407	408	350	376	427	472	527	538	428	436
Normal-Dry		602	541	509	464	388	451	535	555	568	600	582	525
Dry		711	714	680	603	568	580	643	639	654	777	657	611
Critical High		766	805	782	684	676	641	677	667	700	851	719	724
Critical Low		814	889	882	766	785	693	699	690	742	924	732	118

Source: CALSIM II Modeling (Node EC\_607\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 157: Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								491	552	623	550	378
1922	Normal-Wet	291	102	105	367	355	373	391	491	552	623	140	549
1923	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	551
1924	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1925	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1926	Normal-Dry	620	553	468	440	349	485	610	599	572	630	678	615
1927	Normal-Wet	550	460	470	367	334	364	391	398	500	532	540	550
1928	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1929	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1930	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1931	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1932	Normal-Wet	620	553	480	440	349	485	610	599	572	630	678	615
1933	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1934	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1935	Normal-Wet	544	441	450	432	365	379	475	537	540	630	556	113
1936	Normal-Wet	515	103	116	438	365	379	475	537	540	630	111	111
1937	Normal-Wet	109	102	102	233	365	379	475	537	540	116	110	109
1938	Wet	108	101	102	102	182	364	391	398	500	532	540	550
1939	Dry	620	541	480	440	349	485	610	599	572	630	678	441
1940	Normal-Wet	531	463	333	450	355	373	391	491	552	337	133	113
1941	Wet	428	103	105	103	334	364	391	398	500	298	113	205
1942	Normal-Wet	550	418	383	184	334	364	391	398	500	532	106	272
1943	Normal-Wet	106	102	104	364	334	364	391	398	500	532	540	550
1944	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	119
1945	Normal-Wet	544	452	468	438	365	379	475	537	540	497	227	551
1946	Normal-Wet	544	469	375	438	365	379	475	537	540	630	556	551
1947	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1948	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1949	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1950	Normal-Dry	544	469	468	438	365	379	475	537	446	110	107	334
1951	Normal-Wet	542	463	471	450	355	373	391	491	552	623	550	141
1952	Wet	110	103	102	102	290	364	391	398	500	532	140	550
1953	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1954	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	550
1955	Normal-Dry	620	553	480	440	349	485	610	599	572	113	110	113
1956	Wet	108	272	170	298	334	364	391	398	500	532	540	550
1957	Normal-Dry	542	463	471	450	355	373	391	491	552	623	550	378
1958	Wet	110	103	104	103	334	364	391	398	500	532	540	543
1959	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1960	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1961	Critical High	620	553	480	440	349	485	610	599	572	630	678	615
1962	Normal-Wet	544	469	468	438	365	379	475	537	540	630	556	138
1963	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
1964	Dry	620	553	480	440	349	485	610	599	572	630	116	145
1965	Normal-Wet	550	460	470	407	334	364	391	398	500	474	459	550
1966	Normal-Dry	544	469	468	438	365	379	475	537	540	630	535	376
1967	Wet	110	102	102	102	102	364	391	398	165	532	540	550
1968	Dry	544	469	468	438	365	379	475	537	540	630	106	106
1969	Wet	103	101	102	101	102	364	391	398	500	532	107	136
1970	Normal-Dry	536	460	470	407	334	364	391	398	500	532	540	550
1971	Normal-Dry	550	460	470	407	334	364	391	398	500	532	540	550
1972	Normal-Dry	544	469	468	438	365	379	475	537	540	630	556	551
1973	Normal-Wet	542	463	191	318	355	373	391	491	552	623	112	550
1974	Normal-Wet	439	374	169	222	334	364	391	398	500	532	540	550
1975	Normal-Wet	531	412	463	386	334	364	391	398	500	532	540	550
1976	Critical High	814	889	882	766	785	693	699	690	742	924	732	760
1977	Critical Low	814	889	882	766	785	693	699	690	742	924	732	115
1978	Wet	105	101	102	104	224	373	391	491	552	623	230	550
1979	Normal-Wet	395	444	299	436	365	379	475	537	540	630	105	109
1980	Wet	103	102	104	127	245	373	391	491	552	623	550	550
1981	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	121
1982	Wet	110	101	102	103	306	364	391	226	107	103	102	105
1983	Wet	102	101	101	101	101	250	259	104	106	105	103	510
1984	Normal-Wet	544	460	470	407	334	364	391	398	500	532	540	550
1985	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	118
1986	Wet	103	101	102	103	332	364	391	398	500	508	515	550
1987	Dry	620	553	480	440	349	485	610	599	572	630	678	615
1988	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1989	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
1990	Dry	814	889	882	766	785	693	699	690	742	924	732	760
1991	Normal-Dry	814	889	882	766	785	693	699	690	742	924	732	760
1992	Dry	814	889	882	766	785	693	699	690	742	924	732	403
1993	Wet	528	103	220	231	355	373	391	491	552	623	550	550
1994	Dry	814	889	882	766	785	693	699	690	742	924	602	122
1995	Wet	107	101	102	103	102	360	391	398	500	414	540	459
1996	Normal-Wet	109	413	103	393	334	364	391	398	500	111	103	105
1997	Wet	112	415	105	407	334	364	391	398	500	532	528	117
1998	Wet	106	101	102	101	101	363	390	398	488	291	511	516
1999	Normal-Wet	550	460	470	407	334	364	391	398	500	532	540	550
2000	Normal-Wet	498	463	400	450	355	373	391	491	552	623	550	550
2001	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2002	Normal-Dry	620	553	480	440	349	485	610	599	572	630	678	615
2003	Normal-Wet	542	463	471	450	355	373	391					
	Average	501	460	426	414	392	441	497	517	551	593	497	462
	Wet	153	132	114	143	236	358	383	386	439	457	384	437
	Normal-Wet	471	398	351	390	350	376	427	472	527	529	391	397
	Normal-Dry	601	541	508	464	388	451	535	555	564	598	581	491
	Dry	711	713	680	603	568	580	643	639	654	777	600	509
	Critical High	766	805	782	685	676	641	677	667	700	851	719	724
	Critical Low	814	889	882	766	785	693	699	690	742	924	732	115

Source: CALSIM II Modeling (Node EC\_608\_FINAL)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 158: Simulated Electrical Conductivity at San Joaquin River below Sack Dam (umhos/cm) - Proposed Action

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								410	290	623	550	287
1922	Normal-Wet	131	108	296	313	344	361	365	410	290	623	170	287
1923	Normal-Wet	198	120	413	399	353	367	441	537	540	630	556	551
1924	Critical High	227	889	882	766	785	693	699	539	327	924	732	332
1925	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
1926	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
1927	Normal-Wet	199	120	414	366	324	352	365	336	268	532	540	289
1928	Normal-Dry	198	880	415	409	344	361	365	410	290	623	550	287
1929	Dry	258	664	764	689	755	667	645	568	369	924	732	374
1930	Dry	215	424	423	400	338	468	564	599	572	630	678	615
1931	Critical High	227	889	882	766	785	693	699	539	328	924	732	336
1932	Normal-Wet	193	124	409	390	335	463	551	471	267	630	678	281
1933	Normal-Dry	227	1,247	735	668	747	660	630	539	327	924	732	332
1934	Dry	227	619	735	668	747	660	630	539	327	924	732	332
1935	Normal-Wet	198	120	413	399	353	367	441	447	285	630	556	176
1936	Normal-Wet	198	113	293	399	353	367	441	447	285	630	111	120
1937	Normal-Wet	149	101	103	323	353	367	441	447	285	116	111	113
1938	Wet	110	102	102	101	181	352	365	336	268	532	540	287
1939	Dry	215	424	423	400	338	468	564	496	298	630	678	317
1940	Normal-Wet	198	120	415	409	344	361	365	410	290	339	134	117
1941	Wet	199	120	100	100	324	352	365	336	268	298	134	183
1942	Normal-Wet	199	120	341	228	324	352	365	336	268	532	114	287
1943	Normal-Wet	104	111	178	333	324	352	365	336	268	532	540	289
1944	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	122
1945	Normal-Wet	198	120	413	399	353	367	441	447	285	630	556	287
1946	Normal-Wet	198	120	413	399	353	367	441	447	285	630	556	287
1947	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	317
1948	Normal-Dry	198	890	413	399	353	367	441	447	285	630	556	287
1949	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
1950	Normal-Dry	198	890	413	399	353	367	441	447	285	136	113	287
1951	Normal-Wet	198	120	415	409	344	361	365	410	290	623	550	129
1952	Wet	151	112	103	101	281	352	365	336	268	532	540	287
1953	Normal-Dry	199	875	414	371	324	352	365	336	268	532	540	287
1954	Normal-Dry	198	880	415	409	344	361	365	410	290	623	550	287
1955	Normal-Dry	215	1,032	423	400	338	468	564	496	298	119	111	115
1956	Wet	105	113	100	100	324	352	365	336	268	532	540	287
1957	Normal-Dry	198	880	415	409	344	361	365	410	290	623	550	287
1958	Wet	151	118	100	100	324	352	365	336	268	532	540	287
1959	Normal-Dry	198	890	413	399	353	367	441	447	285	630	556	290
1960	Dry	215	424	423	400	338	468	564	599	572	630	678	615
1961	Critical High	215	553	480	440	349	485	610	496	298	630	678	314
1962	Normal-Wet	198	120	413	399	353	367	441	447	285	630	556	287
1963	Normal-Wet	199	120	414	371	324	352	365	336	268	532	540	289
1964	Dry	215	424	423	400	338	468	564	496	298	630	678	314
1965	Normal-Wet	199	120	414	371	324	352	365	336	268	532	540	287
1966	Normal-Dry	198	890	413	399	353	367	441	447	285	630	556	287
1967	Wet	184	109	103	101	102	352	365	336	127	532	540	289
1968	Dry	198	364	413	399	353	367	441	447	285	630	108	109
1969	Wet	104	101	102	102	102	352	365	336	268	532	108	123
1970	Normal-Dry	199	875	414	371	324	352	365	336	268	532	540	287
1971	Normal-Dry	199	875	414	371	324	352	365	336	268	532	540	289
1972	Normal-Dry	198	890	413	399	353	367	441	447	285	630	556	287
1973	Normal-Wet	198	120	222	409	344	361	365	410	290	623	550	287
1974	Normal-Wet	199	116	355	279	324	352	365	336	268	532	540	287
1975	Normal-Wet	199	120	414	371	324	352	365	398	500	932	540	550
1976	Critical High	258	889	882	766	785	693	699	690	742	924	732	760
1977	Critical Low	814	889	882	766	785	693	699	539	388	924	732	116
1978	Wet	105	101	103	100	223	361	365	410	290	623	550	287
1979	Normal-Wet	198	120	386	397	353	367	441	447	285	630	108	114
1980	Wet	103	101	100	100	241	361	365	410	290	623	550	287
1981	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	209
1982	Wet	181	102	103	100	295	352	365	336	110	104	103	106
1983	Wet	103	101	102	102	102	243	244	103	107	107	104	284
1984	Normal-Wet	198	120	414	371	324	352	365	336	268	532	540	287
1985	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	118
1986	Wet	104	101	103	100	322	352	365	336	268	508	515	287
1987	Dry	215	424	423	400	338	468	564	496	298	630	678	317
1988	Dry	258	664	764	689	755	667	645	568	369	924	732	374
1989	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
1990	Dry	258	664	764	689	755	667	645	568	369	924	732	374
1991	Normal-Dry	227	1,247	735	668	747	660	630	539	327	924	732	336
1992	Dry	227	619	735	668	747	660	630	539	327	924	732	332
1993	Wet	198	120	100	100	344	361	365	410	290	623	550	287
1994	Dry	227	619	735	668	747	660	630	539	327	924	732	186
1995	Wet	106	102	102	100	103	349	365	336	268	414	540	289
1996	Normal-Wet	142	120	215	370	324	352	365	336	268	132	104	107
1997	Wet	144	120	100	100	324	352	365	336	268	532	528	120
1998	Wet	104	101	102	102	102	351	364	336	263	291	540	287
1999	Normal-Wet	199	120	414	371	324	352	365	336	268	532	540	289
2000	Normal-Wet	198	120	415	409	344	361	365	410	290	623	550	287
2001	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
2002	Normal-Dry	215	1,032	423	400	338	468	564	496	298	630	678	314
2003	Normal-Wet	198	120	415	409	344	361	365					
	Average	199	472	394	378	380	427	463	435	303	596	527	284
	Wet	134	108	102	101	231	347	357	336	243	457	433	249
	Normal-Wet	187	118	360	372	339	364	397	400	298	538	428	262
	Normal-Dry	208	982	445	420	374	435	494	458	293	600	582	275
	Dry	227	528	586	539	546	557	590	538	368	777	657	355
	Critical High	232	805	782	684	676	641	677	566	424	851	719	435
	Critical Low	814	889	882	766	785	693	699	539	388	924	732	116

Source: CALSIM II Modeling (Node EC\_608\_FINAL)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 159: Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - No-Action Alternative

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								821	905	1,022	972	894
1922	Normal-Wet	932	868	652	314	495	496	832	650	987	824	740	774
1923	Normal-Wet	1,158	998	938	878	1,355	535	741	558	874	986	897	1,122
1924	Critical High	1,261	1,191	1,355	1,747	1,662	1,459	1,293	767	855	885	810	908
1925	Normal-Dry	1,000	766	917	1,250	1,456	1,276	1,232	873	917	996	926	1,094
1926	Normal-Dry	1,331	969	1,081	1,585	1,652	1,391	1,237	845	975	1,126	992	1,035
1927	Normal-Wet	1,140	926	1,240	1,321	1,406	1,240	1,186	711	940	1,028	1,050	982
1928	Normal-Dry	1,094	886	1,077	1,166	1,307	1,252	1,198	814	909	979	882	999
1929	Dry	1,230	866	1,418	1,420	1,653	1,348	1,185	841	875	986	996	1,048
1930	Dry	1,114	973	1,267	1,694	1,731	1,485	1,186	840	908	980	914	1,079
1931	Critical High	1,428	1,701	1,517	1,576	1,536	1,570	1,255	790	896	1,042	1,011	939
1932	Normal-Wet	1,027	1,073	1,512	1,450	1,483	1,378	1,275	730	820	920	883	1,015
1933	Normal-Dry	1,035	1,010	1,274	1,520	1,639	1,439	1,326	745	816	906	799	987
1934	Dry	1,203	1,045	1,221	1,475	1,556	1,569	1,337	768	887	936	960	1,062
1935	Normal-Wet	962	743	1,059	1,198	1,316	1,207	1,231	746	887	975	949	644
1936	Normal-Wet	891	762	583	1,356	1,413	512	841	510	862	972	1,083	531
1937	Normal-Wet	809	482	351	899	815	515	839	713	895	637	718	532
1938	Wet	522	388	398	319	413	444	745	495	892	1,008	893	946
1939	Dry	973	891	1,057	1,409	1,596	1,296	1,210	817	834	937	1,000	1,017
1940	Normal-Wet	1,138	995	578	1,223	1,388	956	859	658	835	707	667	623
1941	Wet	709	696	427	577	458	457	799	563	869	752	780	667
1942	Normal-Wet	983	917	644	358	462	451	794	629	812	712	599	586
1943	Normal-Wet	615	671	629	985	861	472	806	645	843	919	904	990
1944	Normal-Dry	1,085	873	1,209	1,029	1,332	1,142	1,190	741	841	943	886	660
1945	Normal-Wet	892	903	948	1,310	620	463	856	454	732	509	569	758
1946	Normal-Wet	957	1,042	923	1,129	1,332	1,158	1,197	559	809	687	728	739
1947	Normal-Dry	1,255	1,271	1,451	1,388	1,605	1,275	1,205	785	882	950	880	1,210
1948	Normal-Dry	1,269	943	1,376	1,282	1,310	1,218	1,176	751	847	965	878	1,039
1949	Normal-Dry	1,067	937	1,275	1,187	1,450	1,176	1,213	776	896	954	941	1,089
1950	Normal-Dry	1,188	938	1,298	1,090	1,351	1,155	1,203	773	857	705	753	624
1951	Normal-Wet	982	866	1,293	1,118	1,298	1,184	1,220	752	881	1,021	696	726
1952	Wet	729	470	314	351	418	402	729	724	891	1,101	697	814
1953	Normal-Dry	1,190	906	972	1,293	1,398	1,162	1,230	737	888	954	935	992
1954	Normal-Dry	1,132	1,006	1,201	1,163	1,337	1,153	1,197	791	888	966	855	1,005
1955	Normal-Dry	1,256	1,059	1,117	1,385	1,453	1,194	1,233	795	899	880	617	746
1956	Wet	1,084	911	630	385	384	409	731	567	859	947	882	1,000
1957	Normal-Dry	1,113	908	1,033	1,095	1,280	1,104	1,197	682	898	970	878	925
1958	Wet	824	343	361	410	446	436	703	637	862	976	923	957
1959	Normal-Dry	1,241	857	974	1,337	1,487	1,189	1,182	799	873	966	895	1,014
1960	Dry	1,230	902	1,127	1,355	1,505	1,174	1,241	827	931	980	927	1,072
1961	Critical High	1,377	1,321	1,271	1,399	1,604	1,446	1,262	860	952	1,006	945	932
1962	Normal-Wet	787	816	1,084	975	1,180	1,052	1,200	770	890	976	1,039	1,055
1963	Normal-Wet	958	761	897	975	1,154	1,028	1,103	708	915	984	935	1,109
1964	Dry	1,282	934	1,161	1,291	1,352	1,197	1,203	762	949	1,015	752	1,046
1965	Normal-Wet	1,047	852	888	982	1,136	362	722	645	685	768	643	860
1966	Normal-Dry	1,186	857	925	1,187	1,261	1,085	1,202	819	931	1,093	1,055	1,070
1967	Wet	936	407	357	268	329	366	653	486	886	1,057	939	928
1968	Dry	1,192	792	929	1,200	1,276	1,066	1,136	848	868	988	773	521
1969	Wet	655	392	358	371	416	411	687	485	979	944	574	707
1970	Normal-Dry	809	784	891	1,096	1,169	984	1,112	712	923	1,091	988	1,032
1971	Normal-Dry	1,205	818	900	1,117	1,170	1,039	1,170	739	900	980	1,100	1,052
1972	Normal-Dry	1,420	793	988	1,149	1,192	985	1,279	798	896	941	974	896
1973	Normal-Wet	971	1,035	652	943	775	435	752	469	675	634	700	777
1974	Normal-Wet	753	834	535	837	638	432	745	512	939	965	1,053	598
1975	Normal-Wet	777	823	956	433	542	430	778	387	924	1,009	888	1,052
1976	Critical High	1,350	858	942	1,186	1,328	1,016	1,130	743	986	1,044	911	1,309
1977	Critical Low	1,603	957	1,006	1,309	1,476	1,423	1,314	788	963	1,034	1,027	731
1978	Wet	839	495	476	338	332	391	495	601	754	923	634	702
1979	Normal-Wet	725	786	676	1,065	1,165	536	840	507	920	976	505	549
1980	Wet	735	632	868	430	353	389	747	522	934	918	896	960
1981	Normal-Dry	977	799	929	1,210	1,339	1,082	1,177	721	898	983	1,044	747
1982	Wet	693	354	325	498	370	382	542	374	477	646	563	498
1983	Wet	457	413	430	320	265	277	560	550	461	604	760	615
1984	Normal-Wet	924	794	916	1,086	1,112	905	1,038	597	966	1,061	827	791
1985	Normal-Dry	1,060	880	1,025	1,160	1,199	1,012	1,175	708	905	990	976	593
1986	Wet	559	429	357	643	597	417	672	581	912	936	915	1,041
1987	Dry	1,117	879	1,066	1,316	1,428	1,149	1,190	746	940	985	945	1,180
1988	Dry	1,512	1,080	1,098	1,276	1,523	1,316	1,242	870	1,033	1,052	1,007	1,166
1989	Normal-Dry	1,159	1,330	1,706	1,403	1,612	1,401	1,222	802	972	1,037	1,012	1,143
1990	Dry	1,597	1,537	1,308	1,395	1,602	1,402	1,280	882	1,014	1,105	1,013	1,384
1991	Normal-Dry	1,081	1,280	1,339	1,392	1,539	1,416	1,368	789	945	1,026	976	1,123
1992	Dry	1,156	1,247	1,392	1,390	1,593	1,485	1,368	889	919	988	951	1,070
1993	Wet	1,077	1,572	1,577	734	480	443	716	503	957	1,044	991	1,069
1994	Dry	1,601	1,111	1,431	1,400	1,678	1,323	1,368	832	947	1,010	981	1,040
1995	Wet	605	398	362	288	265	331	798	629	896	1,023	712	634
1996	Normal-Wet	782	771	515	1,145	1,023	495	815	538	689	555	372	676
1997	Wet	708	965	847	1,211	1,378	1,189	1,192	745	961	1,027	698	510
1998	Wet	721	434	452	325	276	358	671	489	919	1,115	707	564
1999	Normal-Wet	1,099	894	858	1,141	1,323	1,024	1,164	862	932	1,050	1,093	685
2000	Normal-Wet	769	934	762	1,213	1,316	1,179	1,219	593	785	965	942	1,078
2001	Normal-Dry	1,052	954	1,081	1,204	1,576	1,245	1,271	895	891	1,040	955	1,149
2002	Normal-Dry	1,251	1,033	1,243	1,337	1,530	1,301	1,297	918	988	1,072	1,043	1,165
2003	Normal-Wet	1,403	1,028	1,019	1,358	1,547	1,284	1,251					
Average		1,037	878	945	1,061	1,147	954	1,052	698	881	943	867	898
Wet		741	581	534	467	449	444	715	559	844	939	785	788
Normal-Wet		939	863	844	1,028	1,086	789	972	621	854	868	812	802
Normal-Dry		1,144	952	1,137	1,251	1,402	1,195	1,221	784	901	980	927	975
Dry		1,267	1,021	1,206	1,385	1,541	1,317	1,246	827	925	997	935	1,057
Critical High		1,354	1,268	1,271	1,477	1,532	1,373	1,235	790	922	994	919	1,022
Critical Low		1,603	957	1,006	1,309	1,476	1,423	1,314	788	963	1,034	1,027	731

Source: CALSIM II Modeling (Node EC\_620\_FINAL)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Restoration Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 160: Simulated Electrical Conductivity at San Joaquin River at Merced River Confluence (umhos/cm) - Proposed Action

WY	Year Type	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1921	Normal-Wet								770	780	1,022	972	871
1922	Normal-Wet	742	788	670	313	494	494	820	620	865	825	758	741
1923	Normal-Wet	744	617	885	859	1,344	533	733	558	874	986	897	1,122
1924	Critical High	749	1,199	1,364	1,747	1,663	1,459	1,293	736	746	885	810	868
1925	Normal-Dry	690	609	865	1,202	1,441	1,261	1,205	825	790	996	926	1,013
1926	Normal-Dry	808	721	1,063	1,486	1,631	1,372	1,210	799	862	1,126	992	999
1927	Normal-Wet	788	625	1,122	1,265	1,393	1,225	1,158	676	834	1,028	1,050	922
1928	Normal-Dry	778	585	1,022	1,118	1,295	1,237	1,169	765	786	979	882	920
1929	Dry	796	848	1,334	1,368	1,637	1,334	1,167	806	771	986	996	974
1930	Dry	737	862	1,295	1,505	1,604	1,389	1,155	840	908	980	914	1,079
1931	Critical High	793	1,701	1,518	1,577	1,536	1,570	1,256	755	766	1,042	1,011	916
1932	Normal-Wet	701	520	1,267	1,380	1,467	1,358	1,240	694	685	920	883	922
1933	Normal-Dry	677	650	1,181	1,450	1,619	1,417	1,289	715	706	906	799	916
1934	Dry	732	976	1,125	1,398	1,561	1,572	1,306	736	767	936	960	993
1935	Normal-Wet	732	569	987	1,160	1,305	1,194	1,201	713	761	975	949	735
1936	Normal-Wet	681	551	603	1,301	1,117	510	830	503	749	972	1,083	620
1937	Normal-Wet	774	496	437	877	811	513	828	682	790	637	747	578
1938	Wet	541	446	407	327	413	443	736	477	791	1,008	893	884
1939	Dry	689	842	1,021	1,336	1,577	1,280	1,185	781	733	937	1,000	989
1940	Normal-Wet	843	562	576	1,175	1,374	916	847	633	721	707	669	728
1941	Wet	631	506	340	407	457	456	788	541	768	753	951	648
1942	Normal-Wet	741	545	636	356	462	450	783	600	732	712	865	573
1943	Normal-Wet	681	573	657	954	940	471	795	616	749	919	904	929
1944	Normal-Dry	770	543	1,142	996	1,319	1,130	1,166	711	753	943	886	837
1945	Normal-Wet	742	564	912	1,002	618	462	844	451	657	509	569	718
1946	Normal-Wet	672	543	938	1,088	1,319	1,145	967	494	716	687	728	703
1947	Normal-Dry	784	539	1,115	1,314	1,585	1,260	1,180	749	767	950	880	1,094
1948	Normal-Dry	780	695	1,286	1,228	1,298	1,204	1,150	716	735	965	878	952
1949	Normal-Dry	751	639	1,252	1,140	1,434	1,163	1,187	742	778	955	941	1,020
1950	Normal-Dry	753	597	1,301	1,050	1,338	1,142	1,175	734	788	1,299	938	606
1951	Normal-Wet	695	518	1,098	1,076	1,287	1,171	1,189	713	762	1,021	665	693
1952	Wet	736	417	362	373	417	402	720	682	785	1,101	697	767
1953	Normal-Dry	754	563	930	1,237	1,384	1,149	1,199	694	766	954	935	920
1954	Normal-Dry	754	766	1,154	1,117	1,324	1,140	1,168	746	769	966	855	926
1955	Normal-Dry	784	790	1,122	1,316	1,438	1,181	1,206	758	779	1,131	636	772
1956	Wet	861	508	398	291	384	408	722	548	752	947	882	921
1957	Normal-Dry	727	558	1,007	1,057	1,268	1,092	1,168	654	776	970	878	880
1958	Wet	813	307	321	420	445	435	696	609	744	976	923	900
1959	Normal-Dry	772	494	940	1,267	1,471	1,176	1,156	756	755	966	895	946
1960	Dry	777	841	1,137	1,288	1,489	1,163	1,219	827	931	980	927	1,072
1961	Critical High	823	1,321	1,271	1,399	1,604	1,446	1,262	814	813	1,006	945	909
1962	Normal-Wet	635	437	887	947	1,171	1,042	1,173	733	767	976	1,039	1,026
1963	Normal-Wet	673	555	870	948	1,146	1,019	1,079	672	803	984	935	1,011
1964	Dry	793	885	1,116	1,231	1,339	1,184	1,178	730	827	1,015	875	980
1965	Normal-Wet	704	553	871	954	1,119	362	714	616	638	768	643	813
1966	Normal-Dry	753	510	893	1,135	1,250	1,074	1,174	773	801	1,093	1,055	999
1967	Wet	838	394	360	310	329	366	647	475	740	1,057	939	867
1968	Dry	756	740	897	1,147	1,265	1,056	1,112	797	758	988	928	567
1969	Wet	693	391	349	417	417	410	680	469	852	944	606	670
1970	Normal-Dry	645	504	864	1,056	1,159	975	1,088	673	784	1,091	988	949
1971	Normal-Dry	760	506	866	1,076	1,160	1,029	1,143	695	776	980	1,100	967
1972	Normal-Dry	827	502	1,019	1,101	1,182	977	1,247	756	785	941	974	871
1973	Normal-Wet	791	556	593	1,114	772	434	743	463	616	634	874	736
1974	Normal-Wet	621	592	451	990	636	431	736	497	808	965	1,053	584
1975	Normal-Wet	632	577	899	400	541	428	768	387	922	1,009	888	1,052
1976	Critical High	836	854	938	1,186	1,328	1,016	1,130	743	986	1,044	911	1,309
1977	Critical Low	1,603	958	1,003	1,309	1,476	1,423	1,314	753	860	1,034	1,027	910
1978	Wet	915	566	491	290	331	391	492	582	675	922	634	687
1979	Normal-Wet	637	538	561	1,029	1,156	534	829	500	790	976	602	587
1980	Wet	790	676	654	287	353	388	738	511	814	918	896	888
1981	Normal-Dry	681	505	899	1,155	1,326	1,071	1,153	696	785	983	1,044	938
1982	Wet	664	357	366	435	370	382	539	372	568	678	575	545
1983	Wet	448	417	442	326	265	277	555	531	487	653	832	598
1984	Normal-Wet	658	489	843	1,045	1,104	898	1,018	464	821	1,061	827	749
1985	Normal-Dry	715	607	962	1,111	1,189	1,003	1,151	684	788	990	976	660
1986	Wet	587	444	378	548	595	416	665	560	795	936	915	955
1987	Dry	737	834	998	1,254	1,414	1,139	1,170	719	806	985	945	1,070
1988	Dry	884	1,073	1,101	1,232	1,509	1,303	1,222	830	882	1,052	1,007	1,064
1989	Normal-Dry	753	939	1,578	1,325	1,591	1,383	1,200	766	826	1,037	1,012	1,038
1990	Dry	907	1,384	1,264	1,338	1,587	1,387	1,258	841	866	1,105	1,013	1,231
1991	Normal-Dry	789	947	1,290	1,332	1,523	1,399	1,335	755	791	1,026	976	1,049
1992	Dry	718	1,160	1,329	1,322	1,576	1,465	1,335	835	775	988	951	1,020
1993	Wet	819	664	582	433	479	442	708	495	832	1,044	991	978
1994	Dry	834	1,052	1,376	1,340	1,683	1,309	1,336	790	801	1,010	985	1,536
1995	Wet	569	433	423	280	265	330	788	596	781	1,023	712	625
1996	Normal-Wet	745	500	635	1,100	1,016	494	804	521	661	675	376	705
1997	Wet	558	501	470	477	1,364	1,087	776	684	822	1,027	704	587
1998	Wet	683	448	515	378	276	358	664	471	809	1,115	707	549
1999	Normal-Wet	723	521	860	1,097	1,311	1,014	1,138	802	783	1,050	1,093	627
2000	Normal-Wet	627	514	686	1,162	1,303	1,167	1,082	569	687	965	942	994
2001	Normal-Dry	729	598	1,035	1,149	1,557	1,231	1,242	841	774	1,040	955	1,047
2002	Normal-Dry	784	554	1,198	1,267	1,512	1,285	1,265	859	845	1,072	1,043	1,056
2003	Normal-Wet	821	467	891	1,291	1,530	1,268	1,218					
Average		745	655	887	1,007	1,135	944	1,024	666	777	955	883	874
Wet		697	467	429	375	447	437	682	538	751	944	804	754
Normal-Wet		712	551	793	995	1,069	781	942	591	758	873	835	786
Normal-Dry		751	622	1,082	1,195	1,387	1,181	1,193	744	782	1,015	935	932
Dry		780	958	1,166	1,313	1,520	1,298	1,220	794	819	997	958	1,048
Critical High		800	1,268	1,273	1,477	1,533	1,373	1,235	762	828	994	919	1,000
Critical Low		1,603	958	1,003	1,309	1,476	1,423	1,314	753	860	1,034	1,027	910

Source: CALSIM II Modeling (Node EC\_620\_FINAL)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Restoration Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 161: Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - No-Action Alternative

Table with columns: WY, Year Type, Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep. Rows include years 1922-2003 and average values for Wet, Above Normal, and Below Normal conditions.

Source: CALSIM II Modeling (Node EC\_630\_FINAL)
Notes:
Simulation Period: WY 1922 -2003
Year type as defined by the San Joaquin Valley Index Year Type
Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 162: Simulated Electrical Conductivity at San Joaquin River at Tuolumne River Confluence (umhos/cm) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	667	673	895	912	773	696	408	536	267	533	585	664
1923	Above Normal	616	687	760	598	542	803	394	670	826	1,013	612	622
1924	Critical	596	731	907	872	1,046	877	971	1,006	1,256	1,191	1,128	992
1925	Below Normal	824	717	946	933	887	842	469	641	1,029	1,120	950	869
1926	Dry	759	718	971	976	1,018	955	597	779	1,128	1,069	964	873
1927	Above Normal	779	733	1,021	1,002	884	878	496	699	910	987	828	778
1928	Below Normal	628	666	928	972	910	454	465	744	1,013	1,064	959	861
1929	Critical	749	720	960	947	983	894	773	923	1,175	1,292	1,152	942
1930	Critical	841	731	972	948	1,004	871	796	872	1,220	1,325	1,180	937
1931	Critical	866	804	973	959	1,096	932	984	1,017	1,233	1,257	1,134	982
1932	Above Normal	846	740	926	927	830	871	480	754	927	1,074	838	800
1933	Dry	668	656	896	875	964	815	566	803	1,046	1,063	975	895
1934	Critical	769	716	958	934	995	887	895	943	1,210	1,197	1,131	998
1935	Above Normal	829	732	956	891	1,004	785	457	660	888	940	804	776
1936	Above Normal	646	667	914	908	693	364	363	545	939	902	597	667
1937	Wet	558	653	910	916	468	442	323	389	831	823	599	665
1938	Wet	637	654	530	614	411	394	309	312	293	404	536	627
1939	Dry	493	644	927	923	835	645	651	716	1,045	1,057	953	854
1940	Above Normal	759	697	951	876	872	405	350	585	872	881	783	690
1941	Wet	649	672	699	626	480	366	296	334	452	465	537	659
1942	Wet	577	654	753	541	371	464	325	326	404	428	523	620
1943	Wet	588	614	801	517	342	415	344	562	572	691	588	700
1944	Below Normal	610	649	882	880	858	737	438	699	898	1,016	916	887
1945	Above Normal	723	691	995	960	631	398	424	647	901	720	558	679
1946	Above Normal	539	643	400	504	437	432	440	591	833	870	781	721
1947	Dry	571	636	750	849	806	885	548	798	1,078	1,120	982	897
1948	Below Normal	753	721	979	959	1,104	868	553	800	877	950	918	885
1949	Below Normal	728	705	975	888	996	773	578	814	1,004	1,063	952	900
1950	Below Normal	738	711	948	840	1,004	848	483	759	888	1,008	930	874
1951	Above Normal	731	750	640	527	319	457	402	775	1,008	981	916	882
1952	Wet	753	732	944	597	672	506	264	259	341	389	505	616
1953	Below Normal	649	685	989	737	701	842	412	622	1,048	958	882	867
1954	Below Normal	745	735	979	954	1,005	868	565	769	971	1,018	924	874
1955	Dry	763	741	967	810	1,043	880	594	801	1,059	1,082	964	907
1956	Wet	802	739	1,056	406	452	433	418	418	335	412	506	624
1957	Below Normal	596	687	944	924	955	837	413	608	952	994	895	855
1958	Wet	708	752	973	887	774	531	225	228	341	438	515	592
1959	Dry	611	699	923	906	795	708	468	703	1,051	1,060	981	862
1960	Critical	768	743	1,025	950	951	900	772	838	1,223	1,260	1,115	974
1961	Critical	937	856	1,039	977	1,138	915	1,013	1,031	1,329	1,348	1,254	1,064
1962	Below Normal	920	782	1,022	966	765	701	403	620	918	1,003	891	855
1963	Above Normal	752	787	1,048	994	941	881	457	671	893	907	812	773
1964	Dry	691	733	1,010	973	1,044	889	763	850	1,104	1,148	1,061	936
1965	Wet	806	802	1,011	543	422	456	372	641	928	899	476	584
1966	Below Normal	669	570	580	699	573	732	471	716	1,097	1,140	1,038	959
1967	Wet	814	795	1,016	979	1,070	643	293	274	281	288	474	565
1968	Dry	573	707	1,003	985	957	775	625	678	1,023	1,028	945	879
1969	Wet	815	736	1,033	810	447	540	309	274	296	380	537	617
1970	Above Normal	442	651	759	347	438	403	426	608	927	1,023	870	809
1971	Below Normal	661	708	935	975	1,049	732	422	607	949	1,022	893	856
1972	Dry	744	768	918	1,050	1,101	976	519	747	1,036	1,085	952	955
1973	Above Normal	862	714	899	896	741	722	466	530	825	792	553	645
1974	Wet	573	523	549	542	593	343	405	450	442	662	575	605
1975	Wet	489	561	842	984	402	355	421	574	410	571	544	622
1976	Critical	387	667	922	928	1,102	930	839	901	1,210	1,377	1,150	956
1977	Critical	944	904	1,033	1,010	1,290	1,497	960	1,044	1,362	1,537	1,468	1,184
1978	Wet	948	883	1,063	899	846	861	504	435	320	531	525	503
1979	Above Normal	729	609	920	634	391	357	432	275	904	869	602	680
1980	Wet	598	626	794	454	399	552	434	460	305	382	516	584
1981	Dry	582	637	913	817	943	751	475	707	1,086	1,109	927	880
1982	Wet	749	734	896	879	401	388	252	249	351	381	489	325
1983	Wet	225	360	479	442	420	300	331	312	286	247	225	349
1984	Above Normal	449	280	400	511	321	417	475	615	919	926	778	780
1985	Dry	555	604	1,040	951	845	804	554	746	942	1,102	954	909
1986	Wet	820	782	1,052	1,105	551	394	326	276	421	721	551	595
1987	Critical	503	516	886	877	970	809	812	884	1,222	1,325	1,219	1,055
1988	Critical	962	821	1,082	1,040	1,216	994	970	1,011	1,351	1,533	1,436	1,127
1989	Critical	973	895	1,121	1,139	1,212	864	697	1,013	1,333	1,524	1,464	1,075
1990	Critical	982	832	1,125	1,126	1,171	1,018	992	997	1,350	1,403	1,296	1,090
1991	Critical	1,022	856	1,161	1,135	1,313	833	696	923	1,478	1,560	1,410	1,177
1992	Critical	972	834	1,128	1,108	1,042	890	973	985	1,278	1,392	1,359	1,175
1993	Wet	1,001	839	1,086	793	926	853	513	482	353	466	582	669
1994	Critical	591	732	989	981	1,017	1,005	941	1,126	1,382	1,562	1,334	1,204
1995	Wet	1,023	862	1,109	850	1,469	365	289	248	283	235	326	603
1996	Wet	630	733	1,048	798	349	386	382	410	492	823	605	687
1997	Wet	628	574	421	272	519	352	457	482	623	1,009	920	713
1998	Wet	674	793	1,041	660	397	418	335	335	272	255	502	608
1999	Above Normal	508	716	988	557	274	403	450	652	992	1,026	865	825
2000	Above Normal	760	749	1,076	1,070	412	352	410	501	658	987	750	730
2001	Dry	609	697	1,063	1,014	1,067	669	560	793	1,051	1,195	1,077	991
2002	Dry	927	825	1,012	1,032	1,203	944	557	844	1,097	1,149	1,022	978
2003	Below Normal	886	839	1,077	1,143	1,212	987	459	695	1,172	1,297	1,120	988
Average		714	710	921	844	803	688	526	654	869	943	853	811
Wet		697	698	875	709	581	477	356	386	412	518	531	600
Above Normal		686	678	853	763	608	558	433	611	889	931	747	741
Below Normal		724	706	937	913	925	786	471	700	986	1,050	944	887
Dry		657	697	953	935	971	823	575	767	1,057	1,097	981	909
Critical		804	772	1,017	996	1,097	945	880	970	1,288	1,380	1,264	1,058

Source: CALSIM II Modeling (Node EC\_630\_FINAL)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the San Joaquin Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 163: Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	684	649	765	798	647	551	349	351	335	530	515	520
1923	Above Normal	554	572	653	563	540	737	365	376	559	633	528	495
1924	Critical	521	578	787	821	1,000	1,008	656	662	698	667	644	623
1925	Below Normal	669	654	815	898	904	951	418	420	654	671	616	582
1926	Dry	616	632	821	861	1,000	1,001	526	547	699	679	626	587
1927	Above Normal	641	605	815	853	767	795	402	392	647	663	586	552
1928	Below Normal	538	541	773	779	913	494	414	456	678	672	612	576
1929	Critical	591	618	814	821	1,000	1,000	581	589	698	679	637	598
1930	Critical	659	660	864	898	1,000	1,000	576	589	698	677	635	593
1931	Critical	656	654	856	904	1,000	1,005	693	694	698	673	644	622
1932	Above Normal	685	692	749	845	738	900	542	507	667	656	600	573
1933	Dry	600	618	832	871	1,000	1,000	581	585	692	672	626	601
1934	Critical	645	674	829	881	1,001	1,001	676	661	696	667	644	624
1935	Above Normal	682	685	851	811	1,023	882	398	409	641	626	599	566
1936	Above Normal	585	619	837	841	556	329	356	412	593	643	528	525
1937	Wet	540	593	793	762	403	376	275	264	592	633	528	524
1938	Wet	556	553	520	549	368	328	249	256	249	382	348	346
1939	Dry	418	511	736	759	838	802	476	507	698	673	617	569
1940	Above Normal	594	637	835	722	719	327	330	378	531	636	583	524
1941	Wet	549	579	645	621	409	306	261	271	466	485	479	504
1942	Wet	507	523	653	443	293	419	313	278	411	463	363	357
1943	Wet	490	497	658	336	263	303	293	373	452	615	508	517
1944	Below Normal	526	529	723	750	814	792	405	466	643	657	609	585
1945	Above Normal	584	592	785	776	495	347	382	370	502	600	495	511
1946	Above Normal	492	553	492	564	456	496	385	375	534	651	578	547
1947	Dry	532	557	710	744	844	1,000	563	575	679	688	639	599
1948	Below Normal	616	628	807	849	1,000	1,000	542	551	624	638	613	592
1949	Below Normal	615	635	821	865	1,000	952	588	604	648	678	629	603
1950	Below Normal	635	630	807	845	1,000	991	497	448	587	669	625	586
1951	Above Normal	618	627	377	320	249	446	387	252	525	662	614	588
1952	Wet	587	616	757	549	622	422	224	200	300	383	345	360
1953	Below Normal	539	548	730	603	635	912	346	345	521	612	601	572
1954	Below Normal	579	622	792	803	949	979	491	487	662	675	626	601
1955	Dry	615	639	780	759	1,000	1,000	579	598	697	698	650	610
1956	Wet	658	663	699	356	364	363	381	374	406	488	470	425
1957	Below Normal	509	571	762	773	901	944	353	360	559	650	602	569
1958	Wet	564	621	783	782	726	465	203	193	327	431	354	359
1959	Dry	521	561	725	747	713	838	441	482	689	681	631	573
1960	Critical	614	663	827	834	949	1,000	572	583	698	692	666	635
1961	Critical	698	687	842	911	1,030	1,000	657	662	698	698	691	659
1962	Below Normal	717	698	835	948	723	733	487	485	693	663	616	588
1963	Above Normal	633	681	839	856	837	941	427	423	590	638	591	559
1964	Dry	588	609	834	821	1,000	1,000	579	587	698	687	647	610
1965	Wet	648	669	750	455	389	515	347	346	475	640	450	477
1966	Below Normal	542	459	616	644	601	877	470	509	698	696	653	623
1967	Wet	628	690	759	752	922	543	258	224	287	298	335	343
1968	Dry	496	578	745	755	740	925	425	454	684	688	628	597
1969	Wet	614	647	799	640	367	401	273	243	242	381	357	365
1970	Above Normal	408	508	629	288	336	365	353	398	476	644	600	552
1971	Below Normal	545	613	784	760	934	843	354	371	554	623	604	572
1972	Dry	549	639	808	817	943	1,000	525	542	698	692	640	620
1973	Above Normal	634	628	808	810	681	609	421	438	514	653	520	511
1974	Wet	500	515	620	521	614	308	367	391	439	587	490	466
1975	Wet	428	488	718	727	327	315	377	371	430	576	483	503
1976	Critical	424	514	775	771	928	999	565	578	698	699	637	627
1977	Critical	658	675	831	886	1,000	1,000	631	634	699	685	718	726
1978	Wet	762	755	871	756	653	677	379	321	401	554	486	446
1979	Above Normal	587	519	763	670	357	320	387	300	440	658	527	535
1980	Wet	516	562	782	382	337	396	354	363	385	463	458	492
1981	Dry	478	510	741	745	912	863	459	452	697	664	639	602
1982	Wet	586	637	797	712	278	302	223	207	366	418	338	246
1983	Wet	202	266	381	338	322	253	281	289	238	222	185	233
1984	Above Normal	352	203	302	339	220	365	362	359	525	633	525	455
1985	Dry	446	498	790	771	833	886	505	506	689	699	610	562
1986	Wet	579	587	777	821	442	305	241	222	405	608	484	444
1987	Critical	433	443	729	774	966	911	552	566	698	698	659	624
1988	Critical	648	665	829	872	1,000	1,005	636	643	699	698	711	661
1989	Critical	745	702	841	937	1,185	1,001	617	620	697	656	662	595
1990	Critical	694	693	849	949	1,169	1,000	637	654	699	682	683	660
1991	Critical	698	686	868	994	1,282	981	656	650	699	691	693	696
1992	Critical	736	730	903	1,023	979	1,000	697	851	712	675	707	719
1993	Wet	799	797	919	670	752	843	551	568	473	568	541	511
1994	Critical	574	613	847	961	1,000	1,008	616	641	751	703	707	683
1995	Wet	758	737	889	705	825	348	250	208	324	258	337	480
1996	Wet	507	534	763	748	329	321	359	314	449	637	512	499
1997	Wet	507	438	312	238	309	234	330	361	542	643	567	520
1998	Wet	530	618	792	643	335	335	281	274	242	253	299	323
1999	Above Normal	357	480	663	535	218	404	378	348	465	664	566	534
2000	Above Normal	545	597	807	769	410	322	389	386	555	669	583	520
2001	Dry	507	555	784	773	942	729	539	543	699	698	655	603
2002	Dry	642	656	808	787	1,001	1,000	547	585	698	698	646	615
2003	Below Normal	698	701	835	906	1,001	1,000	513	540	699	692	643	618
Average		578	599	755	728	726	703	443	447	567	613	565	543
Wet		571	593	717	596	471	401	309	302	385	480	426	427
Above Normal		560	575	700	659	538	537	392	383	548	646	564	534
Below Normal		595	602	777	802	875	882	452	465	632	661	619	590
Dry		539	582	778	785	905	926	519	536	694	686	635	596
Critical		625	641	831	890	1,032	995	626	642	702	684	671	646

Source: CALSIM II Modeling (Node VERNWQFINAL)  
Notes:  
Simulation Period: WY 1922 -2003  
Year type as defined by the San Joaquin Valley Index Year Type  
Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 164: Simulated Electrical Conductivity at San Joaquin River at Vernalis (umhos/cm) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Wet	676	615	765	798	637	496	342	354	335	530	514	518
1923	Above Normal	549	546	654	568	532	772	336	378	558	633	528	494
1924	Critical	521	573	777	821	1,000	990	654	661	698	667	644	623
1925	Below Normal	665	621	815	898	876	785	372	418	655	673	617	583
1926	Dry	609	591	802	852	988	936	468	548	699	682	628	588
1927	Above Normal	637	579	814	852	750	688	362	380	644	664	587	550
1928	Below Normal	533	514	765	776	881	446	377	446	676	673	613	576
1929	Critical	587	586	812	819	977	918	585	599	698	683	639	601
1930	Critical	657	633	864	897	999	869	581	584	699	698	646	595
1931	Critical	656	654	856	903	1,000	1,002	690	692	698	673	644	622
1932	Above Normal	679	650	747	844	725	758	443	496	671	658	602	574
1933	Dry	596	593	848	870	999	896	537	592	698	675	628	604
1934	Critical	641	636	822	880	999	959	678	663	698	667	644	628
1935	Above Normal	675	640	841	809	980	740	358	410	641	627	600	566
1936	Above Normal	581	580	830	840	617	312	327	409	596	652	527	524
1937	Wet	533	562	789	754	444	372	275	286	590	633	528	523
1938	Wet	552	528	519	559	385	329	263	259	251	382	348	346
1939	Dry	414	494	736	759	814	704	478	507	699	675	619	569
1940	Above Normal	592	606	835	722	708	317	310	379	542	637	582	523
1941	Wet	546	552	645	622	443	299	246	248	401	484	478	503
1942	Wet	501	503	654	470	291	398	291	278	410	463	363	357
1943	Wet	487	479	658	384	263	312	284	376	453	622	508	516
1944	Below Normal	522	510	723	750	791	695	365	468	643	658	610	586
1945	Above Normal	581	567	785	776	573	335	364	370	541	600	494	510
1946	Above Normal	490	526	478	564	452	464	367	375	533	651	578	534
1947	Dry	512	526	703	743	819	915	485	551	686	690	640	600
1948	Below Normal	611	610	829	847	998	881	461	548	627	639	614	592
1949	Below Normal	608	602	818	860	990	796	536	605	651	680	630	604
1950	Below Normal	631	599	807	844	964	801	420	454	588	670	625	586
1951	Above Normal	610	597	444	335	249	422	359	258	536	663	615	588
1952	Wet	582	577	750	531	587	423	217	210	306	383	345	360
1953	Below Normal	534	524	730	603	624	820	322	347	525	613	602	572
1954	Below Normal	573	587	788	803	949	808	437	482	660	676	627	599
1955	Dry	610	604	779	758	981	868	513	597	698	698	651	611
1956	Wet	652	625	837	359	368	348	362	329	361	488	469	384
1957	Below Normal	502	536	747	773	904	831	330	361	561	651	603	569
1958	Wet	560	591	783	782	708	462	196	186	328	431	354	359
1959	Dry	517	539	725	747	697	736	394	481	696	683	632	572
1960	Critical	610	627	827	834	916	931	576	582	698	695	668	638
1961	Critical	698	687	842	911	1,000	939	656	662	698	698	691	659
1962	Below Normal	710	652	835	948	711	645	388	473	691	663	616	588
1963	Above Normal	628	649	851	855	824	774	377	422	589	638	591	558
1964	Dry	579	569	821	817	998	923	581	584	698	689	648	611
1965	Wet	643	630	750	481	387	482	320	347	482	640	450	476
1966	Below Normal	537	445	615	643	591	752	393	486	698	697	654	622
1967	Wet	624	643	757	750	887	517	254	225	306	294	335	343
1968	Dry	493	539	745	755	723	783	428	453	687	689	629	596
1969	Wet	610	611	799	736	385	412	273	240	254	381	357	365
1970	Above Normal	406	489	629	271	332	350	332	399	487	644	600	551
1971	Below Normal	541	576	784	760	900	726	329	371	567	623	604	571
1972	Dry	544	603	808	816	958	895	459	541	698	693	640	620
1973	Above Normal	627	595	807	809	669	549	367	415	498	651	519	510
1974	Wet	497	485	624	572	602	302	345	378	428	587	490	456
1975	Wet	422	467	711	740	330	304	360	373	410	575	482	502
1976	Critical	424	510	765	771	928	924	566	578	698	699	637	627
1977	Critical	659	675	831	887	1,000	1,000	631	635	699	685	718	726
1978	Wet	752	722	870	756	783	722	412	326	365	554	486	445
1979	Above Normal	582	502	762	670	355	312	366	292	442	658	526	534
1980	Wet	514	532	769	429	346	408	360	345	344	462	458	491
1981	Dry	476	494	741	745	880	735	410	452	698	665	639	602
1982	Wet	583	604	797	705	291	301	223	215	352	418	338	246
1983	Wet	203	282	390	341	336	251	282	272	240	222	185	233
1984	Above Normal	348	205	310	348	220	353	346	361	527	633	525	455
1985	Dry	423	478	784	771	809	751	442	510	690	699	610	563
1986	Wet	576	561	773	821	469	311	244	226	389	607	483	439
1987	Critical	431	432	729	774	953	767	554	571	699	698	660	626
1988	Critical	644	623	823	872	998	1,001	643	647	699	698	699	664
1989	Critical	730	663	841	937	1,095	943	579	627	697	662	665	596
1990	Critical	687	650	849	949	998	997	649	656	699	688	686	663
1991	Critical	693	652	866	992	1,204	808	625	652	699	697	697	701
1992	Critical	726	681	899	1,020	945	930	698	695	710	683	712	725
1993	Wet	785	730	915	670	732	713	452	474	400	568	541	509
1994	Critical	568	579	844	958	998	1,004	622	643	700	703	710	688
1995	Wet	747	682	883	707	1,078	338	257	217	318	258	337	478
1996	Wet	500	513	760	746	311	318	334	330	451	636	511	498
1997	Wet	503	433	336	239	313	231	321	341	476	644	571	487
1998	Wet	524	572	776	646	353	329	285	288	259	253	299	323
1999	Above Normal	355	465	663	535	218	388	362	349	473	665	566	534
2000	Above Normal	542	559	796	769	389	308	366	368	541	670	583	517
2001	Dry	501	527	775	773	906	653	473	547	699	698	656	604
2002	Dry	639	617	805	788	999	867	495	587	698	698	647	616
2003	Below Normal	692	654	834	904	999	898	418	520	699	694	644	617
Average		573	570	756	732	721	643	418	442	563	615	565	542
	Wet	565	562	721	608	489	391	300	297	371	480	426	423
	Above Normal	555	547	703	660	537	490	359	379	551	646	564	533
	Below Normal	589	572	776	801	860	760	396	460	634	662	620	590
	Dry	532	562	775	784	890	820	474	535	696	687	636	597
	Critical	621	616	828	889	1,001	936	624	634	699	687	672	649

Source: CALSIM II Modeling (Node VERNWQFINAL)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the San Joaquin Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

Table 165: Simulated San Luis Storage (TAF) - No-Action Alternative

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	538	617	1,010	1,579	1,921	2,039	2,039	1,892	1,556	1,256	1,041	1,089
1923	Below Normal	1,134	1,381	1,686	1,905	1,975	2,024	1,976	1,646	1,142	872	680	719
1924	Critical	817	883	1,016	1,166	1,123	1,009	920	848	869	705	517	589
1925	Dry	770	927	1,484	1,778	1,964	1,884	1,906	1,796	1,336	934	800	904
1926	Dry	986	1,198	1,433	1,834	1,968	2,039	2,039	1,786	1,389	1,041	898	1,043
1927	Wet	1,102	1,536	1,974	2,039	2,039	2,039	1,984	1,667	1,255	917	686	724
1928	Above Normal	797	1,048	1,375	1,757	1,930	2,039	2,023	1,678	1,260	715	607	683
1929	Critical	882	1,141	1,399	1,708	1,836	1,821	1,724	1,436	1,013	798	443	399
1930	Dry	478	598	1,159	1,815	2,039	2,039	1,925	1,682	1,248	1,103	887	981
1931	Critical	1,061	1,215	1,375	1,886	2,021	2,024	1,845	1,572	1,175	1,031	690	666
1932	Dry	770	875	1,494	1,920	2,039	2,039	1,888	1,730	1,326	983	1,005	1,263
1933	Critical	1,400	1,605	1,884	2,039	2,039	2,039	1,932	1,749	1,336	913	581	560
1934	Critical	685	804	1,290	1,880	2,039	1,991	1,806	1,499	1,093	686	355	323
1935	Below Normal	418	745	1,045	1,705	1,929	2,039	2,039	1,752	1,366	1,188	810	766
1936	Below Normal	738	767	874	1,482	1,947	2,039	2,039	1,888	1,473	1,292	959	1,064
1937	Below Normal	1,139	1,219	1,407	1,722	2,025	2,039	2,039	2,039	1,727	1,280	1,035	1,169
1938	Wet	1,264	1,675	2,039	2,039	2,039	2,039	2,039	2,039	1,805	1,536	1,273	1,309
1939	Dry	1,466	1,642	1,794	1,916	1,967	2,039	1,740	1,493	1,152	1,076	519	353
1940	Above Normal	417	552	783	1,327	1,830	2,012	1,975	1,705	1,221	754	528	508
1941	Wet	568	712	1,060	1,539	1,911	2,039	2,039	1,995	1,696	1,391	1,174	1,224
1942	Wet	1,381	1,600	1,865	2,039	2,039	2,039	1,998	1,849	1,607	1,320	1,110	1,166
1943	Wet	1,332	1,565	1,730	1,953	2,039	2,039	2,039	1,907	1,463	909	727	799
1944	Dry	964	1,201	1,494	1,777	1,874	2,000	1,836	1,539	1,172	1,062	783	827
1945	Below Normal	868	1,196	1,604	1,903	2,039	2,006	1,845	1,529	1,088	833	647	697
1946	Below Normal	783	1,055	1,445	1,843	1,898	1,768	1,590	1,306	853	653	399	368
1947	Dry	432	584	933	1,266	1,623	1,941	1,662	1,347	976	897	570	375
1948	Below Normal	458	706	824	1,332	1,491	1,693	1,797	1,534	1,189	847	736	822
1949	Dry	992	1,113	1,440	1,701	1,539	1,882	1,789	1,429	942	774	753	855
1950	Below Normal	958	1,248	1,478	1,916	2,039	2,039	2,038	1,764	1,430	1,114	894	1,055
1951	Above Normal	1,271	1,664	2,039	2,039	2,039	2,039	1,920	1,605	1,124	695	476	477
1952	Wet	597	821	1,160	1,573	1,895	2,039	2,039	2,021	1,789	1,447	1,184	1,220
1953	Wet	1,375	1,552	1,704	1,890	1,960	2,039	1,925	1,714	1,363	1,048	722	818
1954	Above Normal	1,032	1,335	1,692	1,869	1,995	2,039	1,981	1,632	1,138	668	376	399
1955	Dry	484	778	1,146	1,546	1,625	1,698	1,603	1,428	1,031	1,015	665	750
1956	Wet	873	1,237	1,599	1,884	2,039	2,039	1,990	1,832	1,546	1,241	911	965
1957	Above Normal	1,132	1,245	1,545	1,679	1,938	2,039	1,713	1,505	1,161	767	685	764
1958	Wet	1,048	1,411	1,634	1,826	1,995	2,039	2,039	1,991	1,754	1,380	1,113	1,147
1959	Below Normal	1,298	1,449	1,644	1,766	1,875	1,734	1,553	1,290	984	794	432	399
1960	Dry	519	715	940	1,255	1,668	1,960	1,672	1,344	993	899	664	773
1961	Dry	757	1,087	1,558	1,955	2,039	2,039	1,790	1,478	1,119	777	667	615
1962	Below Normal	635	753	1,214	1,442	1,711	1,835	1,685	1,397	976	761	551	492
1963	Wet	702	998	1,370	1,771	1,987	1,930	1,908	1,676	1,209	861	688	725
1964	Dry	895	1,153	1,468	1,763	1,802	1,823	1,547	1,205	830	765	636	532
1965	Wet	608	1,000	1,489	1,837	2,039	1,990	1,958	1,680	1,259	869	694	806
1966	Below Normal	935	1,271	1,698	1,910	2,025	2,039	1,853	1,458	999	720	570	537
1967	Wet	729	1,033	1,465	1,749	1,896	2,039	2,039	1,999	1,763	1,546	1,279	1,313
1968	Below Normal	1,466	1,684	1,836	1,988	2,039	2,039	1,725	1,425	1,061	828	637	591
1969	Wet	722	968	1,389	1,799	1,992	2,039	2,039	2,039	1,818	1,646	1,379	1,413
1970	Wet	1,565	1,694	1,847	2,039	2,039	2,039	1,930	1,555	1,086	730	449	398
1971	Wet	477	772	1,143	1,516	1,687	1,968	1,887	1,640	1,272	985	819	887
1972	Below Normal	1,058	1,177	1,508	1,842	1,967	2,039	1,907	1,622	1,265	910	736	766
1973	Above Normal	867	1,280	1,617	1,823	1,994	2,039	1,922	1,624	1,195	907	744	759
1974	Wet	936	1,224	1,614	1,885	2,034	2,039	2,030	1,806	1,414	1,113	900	952
1975	Wet	1,117	1,354	1,686	1,828	1,975	2,039	2,005	1,717	1,410	1,146	960	1,019
1976	Critical	1,185	1,434	1,696	1,889	1,985	2,039	1,913	1,605	1,287	1,147	890	733
1977	Critical	704	865	935	1,160	1,193	1,155	1,019	833	601	325	213	235
1978	Above Normal	335	492	973	1,659	1,942	2,039	2,039	1,985	1,633	1,336	1,064	1,094
1979	Below Normal	1,116	1,290	1,417	1,812	1,967	2,039	1,941	1,806	1,401	1,091	800	860
1980	Above Normal	981	1,302	1,699	1,996	2,039	2,039	2,039	1,868	1,556	1,168	844	953
1981	Dry	1,083	1,237	1,567	1,922	2,014	2,039	1,889	1,565	1,147	883	568	573
1982	Wet	765	1,107	1,522	1,754	1,942	2,039	2,039	2,026	1,765	1,414	1,151	1,188
1983	Wet	1,392	1,627	1,795	1,994	2,039	2,039	2,039	2,039	1,850	1,700	1,507	1,607
1984	Wet	1,758	1,921	2,039	2,039	2,039	2,039	1,848	1,460	1,003	751	579	592
1985	Dry	802	1,101	1,476	1,810	1,921	1,945	1,700	1,322	814	576	409	319
1986	Wet	343	477	800	1,321	1,852	2,039	2,039	2,027	1,742	1,270	1,123	1,257
1987	Dry	1,467	1,709	1,923	2,039	2,039	2,039	1,743	1,474	1,138	1,061	531	337
1988	Critical	360	448	920	1,444	1,367	1,286	1,238	1,012	839	910	605	574
1989	Dry	633	827	1,167	1,487	1,534	1,734	1,574	1,151	728	597	443	341
1990	Critical	345	465	580	1,192	1,266	1,437	1,286	1,143	1,025	934	682	673
1991	Critical	763	894	1,033	1,167	1,275	1,822	1,664	1,429	1,013	804	442	365
1992	Critical	459	510	681	914	1,506	1,837	1,663	1,322	935	478	279	254
1993	Above Normal	282	401	784	1,472	1,781	1,916	1,905	1,628	1,381	1,133	885	947
1994	Critical	1,074	1,105	1,334	1,558	1,805	1,672	1,454	1,119	720	573	502	400
1995	Wet	482	499	958	1,564	1,791	1,979	2,039	2,039	1,775	1,558	1,293	1,327
1996	Wet	1,480	1,621	1,854	2,009	2,039	2,039	2,025	1,909	1,478	994	709	822
1997	Wet	882	1,201	1,645	1,865	2,039	2,039	1,985	1,764	1,353	898	769	811
1998	Wet	938	1,297	1,698	1,909	2,039	2,039	2,039	2,016	1,755	1,540	1,276	1,312
1999	Wet	1,468	1,675	1,837	2,018	2,039	2,039	1,999	1,663	1,222	919	717	835
2000	Above Normal	1,019	1,340	1,570	1,794	1,966	2,039	1,955	1,628	1,137	642	469	402
2001	Dry	537	753	1,080	1,458	1,767	1,943	1,823	1,513	1,066	957	569	503
2002	Dry	595	903	1,478	1,770	1,718	1,666	1,572	1,292	935	785	688	603
2003	Above Normal	600	1,001	1,495	1,751	1,678	1,837	1,734	1,473	1,021	609	440	475
Average		885	1,104	1,419	1,732	1,876	1,940	1,846	1,621	1,257	981	750	771
Wet		996	1,253	1,574	1,834	1,978	2,028	1,998	1,849	1,517	1,197	969	1,025
Above Normal		773	1,023	1,382	1,729	1,921	2,010	1,937	1,685	1,282	887	680	712
Below Normal		929	1,139	1,406	1,755	1,909	1,955	1,859	1,604	1,211	942	706	736
Dry		813	1,022	1,391	1,723	1,841	1,930	1,761	1,476	1,075	899	670	664
Critical		811	948	1,179	1,500	1,621	1,678	1,539	1,297	992	775	516	481

Source: CALSIM II Modeling (Node SAN LUIS Storage)

Notes:

Simulation Period: WY 1922 -2003

Year type as defined by the Sacramento Valley Index Year Type

Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year

San Joaquin River Restoration Program

Table 166: Simulated San Luis Storage (TAF) - Proposed Action

WY	Year Type	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1922	Above Normal	542	634	1,028	1,597	1,911	2,039	2,039	1,826	1,502	1,201	987	1,036
1923	Below Normal	1,086	1,333	1,633	1,852	1,923	1,976	1,954	1,630	1,134	873	689	728
1924	Critical	828	897	1,033	1,182	1,141	1,026	935	862	882	728	539	610
1925	Dry	794	941	1,520	1,784	1,969	1,889	1,924	1,811	1,347	941	803	905
1926	Dry	989	1,230	1,467	1,845	1,978	2,039	2,039	1,773	1,364	1,046	887	1,024
1927	Wet	1,081	1,509	1,954	2,039	2,039	2,039	2,010	1,705	1,276	935	701	740
1928	Above Normal	812	1,062	1,389	1,769	1,911	2,039	2,039	1,692	1,272	722	603	678
1929	Critical	881	1,157	1,408	1,717	1,838	1,858	1,761	1,472	1,044	831	472	428
1930	Dry	508	639	1,203	1,859	2,039	2,039	1,929	1,687	1,247	1,102	886	979
1931	Critical	1,059	1,213	1,373	1,883	2,018	2,031	1,852	1,580	1,181	1,033	692	667
1932	Dry	774	891	1,510	1,920	2,039	2,039	1,946	1,792	1,409	1,023	1,040	1,295
1933	Critical	1,432	1,645	1,918	2,039	2,039	2,039	1,952	1,770	1,355	972	628	606
1934	Critical	731	856	1,352	1,882	2,039	1,994	1,809	1,503	1,096	689	358	327
1935	Below Normal	425	749	1,093	1,753	1,950	2,039	2,039	1,738	1,339	1,150	760	760
1936	Below Normal	727	745	841	1,463	1,941	2,039	2,039	1,826	1,401	1,247	880	977
1937	Below Normal	1,051	1,128	1,310	1,697	2,010	2,039	2,039	2,039	1,673	1,244	991	1,063
1938	Wet	1,168	1,572	2,039	2,039	2,039	2,039	2,039	2,039	1,804	1,534	1,271	1,307
1939	Dry	1,464	1,640	1,792	1,914	1,967	2,039	1,738	1,491	1,147	1,068	511	347
1940	Above Normal	424	557	789	1,330	1,822	2,000	2,023	1,692	1,170	657	456	450
1941	Wet	575	737	1,077	1,511	1,847	1,993	2,034	1,902	1,485	1,177	958	1,009
1942	Wet	1,168	1,398	1,649	1,865	2,028	2,039	2,039	1,867	1,559	1,227	984	1,030
1943	Wet	1,191	1,420	1,579	1,789	1,923	2,039	2,039	1,875	1,429	875	691	777
1944	Dry	963	1,161	1,495	1,753	1,886	2,011	1,875	1,583	1,221	1,115	799	800
1945	Below Normal	838	1,171	1,584	1,886	2,039	2,039	1,930	1,607	1,158	892	701	750
1946	Below Normal	826	1,087	1,459	1,823	1,698	1,791	1,646	1,331	869	659	443	403
1947	Dry	479	648	996	1,294	1,620	1,934	1,743	1,428	1,055	967	637	444
1948	Below Normal	494	756	850	1,352	1,510	1,724	1,849	1,564	1,217	871	728	800
1949	Dry	960	1,147	1,436	1,701	1,812	2,028	1,942	1,551	1,023	800	731	865
1950	Below Normal	957	1,231	1,452	1,862	2,019	2,039	2,039	1,771	1,449	1,091	899	1,071
1951	Above Normal	1,271	1,636	2,039	2,039	2,039	2,039	1,999	1,684	1,202	775	555	553
1952	Wet	680	921	1,263	1,676	1,895	2,039	2,039	2,012	1,780	1,438	1,175	1,212
1953	Wet	1,368	1,543	1,695	1,864	1,939	2,039	1,972	1,758	1,402	1,053	692	787
1954	Above Normal	999	1,301	1,658	1,835	1,960	2,039	2,001	1,650	1,152	676	373	396
1955	Dry	490	784	1,152	1,550	1,672	1,757	1,675	1,496	1,085	992	718	773
1956	Wet	897	1,272	1,601	1,885	2,039	2,039	2,030	1,826	1,515	1,171	784	840
1957	Above Normal	1,008	1,137	1,447	1,602	1,862	2,039	1,720	1,514	1,155	769	685	765
1958	Wet	1,050	1,415	1,634	1,825	1,982	2,039	2,039	1,952	1,689	1,315	1,049	1,083
1959	Below Normal	1,234	1,398	1,580	1,702	1,812	1,666	1,519	1,261	960	786	448	416
1960	Dry	519	722	947	1,265	1,684	1,985	1,691	1,355	992	889	639	740
1961	Dry	719	1,044	1,511	1,945	2,039	2,039	1,787	1,471	1,105	770	651	630
1962	Below Normal	650	767	1,230	1,457	1,705	1,829	1,736	1,444	1,018	797	615	555
1963	Wet	765	1,062	1,433	1,818	1,969	1,931	1,914	1,674	1,222	892	732	776
1964	Dry	949	1,209	1,529	1,803	1,859	1,885	1,608	1,268	889	825	691	596
1965	Wet	667	1,051	1,530	1,832	2,027	2,039	2,039	1,739	1,287	854	645	745
1966	Below Normal	891	1,222	1,621	1,817	1,920	2,029	1,871	1,474	1,014	731	578	545
1967	Wet	740	1,044	1,474	1,746	1,879	2,004	2,039	1,998	1,763	1,545	1,278	1,312
1968	Below Normal	1,464	1,683	1,836	1,987	2,039	2,039	1,725	1,426	1,061	826	640	594
1969	Wet	730	986	1,408	1,802	1,995	2,039	2,039	2,039	1,818	1,646	1,379	1,413
1970	Wet	1,565	1,694	1,847	2,039	2,039	2,039	1,921	1,553	1,091	754	479	429
1971	Wet	512	806	1,178	1,554	1,674	1,962	1,933	1,673	1,283	969	784	845
1972	Below Normal	1,012	1,139	1,465	1,771	1,888	2,015	1,913	1,629	1,272	909	738	767
1973	Above Normal	873	1,285	1,619	1,825	1,997	2,039	1,979	1,676	1,196	915	692	699
1974	Wet	888	1,177	1,568	1,837	1,989	2,039	2,039	1,760	1,332	1,029	815	867
1975	Wet	1,032	1,279	1,585	1,736	1,881	2,023	1,997	1,715	1,403	1,131	949	1,009
1976	Critical	1,175	1,425	1,688	1,882	1,979	2,039	1,915	1,606	1,286	1,148	896	740
1977	Critical	710	871	936	1,163	1,195	1,157	1,022	835	603	326	213	235
1978	Above Normal	338	503	986	1,672	1,953	2,039	2,039	1,987	1,602	1,309	1,042	1,073
1979	Below Normal	1,101	1,289	1,464	1,797	1,931	2,039	1,972	1,806	1,398	1,062	770	831
1980	Above Normal	952	1,273	1,669	1,965	2,039	2,039	2,039	1,872	1,490	1,080	717	829
1981	Dry	964	1,132	1,481	1,814	1,906	2,039	1,917	1,591	1,170	884	572	577
1982	Wet	774	1,116	1,531	1,753	1,924	2,039	2,039	2,020	1,704	1,355	1,092	1,130
1983	Wet	1,287	1,523	1,691	1,890	2,039	2,039	2,039	2,039	1,850	1,700	1,507	1,607
1984	Wet	1,758	1,921	2,039	2,039	2,039	2,039	1,868	1,479	1,023	775	602	623
1985	Dry	833	1,132	1,507	1,810	1,923	1,953	1,741	1,360	844	597	424	328
1986	Wet	354	500	823	1,329	1,847	2,039	2,039	2,027	1,718	1,246	1,101	1,237
1987	Dry	1,446	1,699	1,916	2,039	2,039	2,039	1,743	1,476	1,138	1,061	526	335
1988	Critical	364	447	920	1,443	1,366	1,295	1,246	1,016	840	909	606	574
1989	Dry	633	843	1,178	1,508	1,555	1,759	1,618	1,190	759	625	443	340
1990	Critical	345	478	587	1,197	1,289	1,468	1,315	1,173	1,024	956	701	693
1991	Critical	785	923	1,075	1,188	1,305	1,827	1,690	1,460	1,040	819	442	363
1992	Critical	461	523	697	927	1,518	1,855	1,680	1,333	943	474	280	254
1993	Above Normal	282	413	795	1,480	1,763	1,901	1,847	1,551	1,262	1,039	846	915
1994	Critical	1,045	1,197	1,405	1,681	1,930	1,789	1,551	1,216	816	701	453	346
1995	Wet	458	571	1,009	1,540	1,863	2,039	2,039	2,039	1,746	1,528	1,263	1,297
1996	Wet	1,450	1,605	1,824	1,980	2,039	2,039	2,026	1,872	1,436	951	667	780
1997	Wet	845	1,164	1,603	1,823	2,001	2,039	1,992	1,714	1,308	873	744	803
1998	Wet	936	1,302	1,677	1,888	2,039	2,039	2,039	2,007	1,745	1,530	1,266	1,302
1999	Wet	1,459	1,665	1,828	2,007	2,039	2,039	2,010	1,673	1,229	922	716	833
2000	Above Normal	1,020	1,340	1,635	1,792	1,963	2,039	1,986	1,640	1,146	650	492	422
2001	Dry	555	736	1,064	1,441	1,752	1,939	1,859	1,548	1,097	987	674	604
2002	Dry	696	1,020	1,595	1,839	1,786	1,747	1,663	1,369	988	803	703	627
2003	Above Normal	629	1,023	1,506	1,750	1,669	1,828	1,785	1,533	1,074	654	480	514
Average		876	1,102	1,417	1,723	1,872	1,947	1,868	1,633	1,257	977	741	761
Wet		977	1,241	1,559	1,812	1,962	2,028	2,010	1,844	1,496	1,170	936	992
Above Normal		763	1,014	1,380	1,721	1,907	2,007	1,958	1,693	1,268	871	661	694
Below Normal		911	1,121	1,387	1,730	1,885	1,950	1,876	1,610	1,212	938	706	733
Dry		819	1,034	1,405	1,727	1,863	1,953	1,802	1,513	1,104	916	685	678
Critical		818	969	1,199	1,515	1,638	1,698	1,561	1,319	1,009	799	523	487

Source: CALSIM II Modeling (Node SAN LUIS Storage)  
 Notes:  
 Simulation Period: WY 1922 -2003  
 Year type as defined by the Sacramento Valley Index Year Type  
 Key: cfs = cubic feet per second, TAF = thousand acre-feet, WY = Water Year